



Technology Collaboration Programme  
on Demand Side Management  
Technologies and Programmes

*Fifty Third Executive Committee Meeting*  
Pre-Meeting Document (PMD) – Part 1

*3 – 5 April*  
Bern, Switzerland




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# MATTERS FOR THE EXECUTIVE COMMITTEE

## Document A (Pages 10 -13)

### Agenda

- ExCo **approval** of the Agenda
- ExCo **approval** of the Minutes from the 52nd Executive Committee meeting (distributed earlier)
- ExCo **approval** of Minutes from ExCo Telco, 12 December 2018 (distributed earlier)
- ExCo approval of Minutes from ExCo Telco 22 February (distributed earlier)

## Document B (Pages 14 - 20)

### Actions from the 52<sup>nd</sup> ExCo meeting

- Note status of action items from the 52<sup>nd</sup> ExCo meeting in London and agree further action where necessary
- Note status of action items from the ExCo Telco 12 December and agree further action where necessary
- Note status of action items from the ExCo Telco 22 February and agree further action where necessary

## Document C (Pages 21)

### Proposal for format of ExCo meeting Minutes

- **ExCo Approval** of a new format for the ExCo meeting Minutes

## Document E (Pages 29 - 38)

### TASK 25 Phase 2 – Task Status Report

- Discuss how the ExCo can facilitate the organisation of Task meetings connected to the ExCo meeting, because of the international nature of the TCP and the difficulty of gathering international experts in between ExCo meetings.
- **Approve** Task Status Report

## Document F (Pages 39 - 61)

### Global Observatory on Community Self-Consumption and Peer-to-Peer Energy Trading

- The Task requests **ExCo Approval** conditional on: a) receipt of required National Participation Plans from at least two DSM participating countries; and b) identification of leads for the seven sub-tasks. This is in accordance with the DSM Implementing Agreement which states: "Each Annex shall enter into force at such time as the Executive Committee, acting by unanimity of those Contracting Parties which have communicated to the Executive Director a Notice of Participation in that Annex, determines that there is sufficient participation to perform the Task...".
- **Approve** Task Operating Agent

## DOCUMENT G (Pages 62 - 70)

### Social Licence to Automate DSM

- The Task requests **ExCo Approval** conditional on: a) receipt of required National Participation Plans from at least 4 DSM participating countries; and b) identification of leads

<p>for the 4 sub-tasks. This is in accordance with the DSM Implementing Agreement which states: “Each Annex shall enter into force at such time as the Executive Committee, acting by unanimity of those Contracting Parties which have communicated to the Executive Director a Notice of Participation in that Annex, determines that there is sufficient participation to perform the Task...”.</p> <ul style="list-style-type: none"> <li>➤ <b>Approve</b> Task Operating Agent</li> </ul>
<p><b>Document H</b> (Pages 71 – 104) <b>Hard to reach Energy Users – Task proposal</b></p> <ul style="list-style-type: none"> <li>➤ <b>ExCo Approval</b> of launch of the Task on Hard to Reach Energy Users</li> <li>➤ <b>Approve</b> Task Operating Agent</li> </ul>
<p><b>Document I</b> (Pages 105 - 107) <b>Energy-Sector Behavioural Insights Platform – revised concept note</b></p> <ul style="list-style-type: none"> <li>➤ <b>Approval</b> for entry into the Task Definition Phase (TDP)</li> </ul>
<p><b>Document J</b> (Pages 108 – 109) <b>Best practices in Desinging &amp; Implementing Energy Efficiency Obligations 2.0</b></p> <ul style="list-style-type: none"> <li>➤ <b>Approval</b> for entry into the Task Definition Phase (TDP)</li> </ul>
<p><b>Document K</b> (Pages 110 – 114) <b>What’s in an algorithm? Towards inclusive and user-centered development for energy optimization</b></p> <ul style="list-style-type: none"> <li>➤ <b>Approval</b> for entry into the Task Definition Phase (TDP)</li> </ul>
<p><b>Document L</b> (Pages 115 - 117) <b>Strategic Plan 2020-2025</b></p> <ul style="list-style-type: none"> <li>➤ <b>Approval</b> of the strategic direction outlined in the Strategic Plan 2020-2025 noting that wording will change subject to discussions on the change of name and the approval of Task full proposals and Task concept notes discussed at the ExCo.</li> </ul>
<p><b>Document M</b> (Pages 118 - 121 ) <b>New name for the TCP?</b></p> <ul style="list-style-type: none"> <li>➤ Note the important sessions on this topic. Further details will be circulated once the tender process for the facilitator has been completed.</li> </ul>
<p><b>Document N</b> (Pages 122 - 123) <b>ESC report</b></p> <ul style="list-style-type: none"> <li>➤ <b>Approve</b> the ESC report</li> </ul>
<p><b>Document O</b> (Pages 124 – 130) <b>Operating Agent Report</b></p> <ul style="list-style-type: none"> <li>➤ <b>Approve</b> the Operating Agent report</li> </ul>
<p><b>Document P</b> (Pages 131 - 137) <b>Draft Communications strategy</b></p>



- Note the discussion points.

**Finance report – PMD Part 2**

- **Approve the Financial Report 2018 and Budget 2019**

**Document Q (Pages 138 - 142)**

**Updated Guidance**

- **Note discussion points.**

# AGENDA

## Demand-Side Management Technology Collaboration Programme (DSM TCP) Fifty-Third Executive Committee Meeting

3 – 5 April 2019; Bern, Switzerland

### Wednesday 3 April

Wednesday 3 April

08:30 – 16:30

**DSM Day: Policy and Business Models for the Digital, Customer centred Energy Transition**, organised by BFE, Switzerland and DSM TCP

Time	Topic	Speaker	
<b>08:45</b>	<b>09:15</b>	<b>Registration</b>	
09:15	09:30	Welcome SFOE	Rolf Schmitz, Swiss Federal Office of Energy SFOE
09:30	09:45	DSM TCP vision and strategy	David Shipworth, IEA DSM Chair
09:45	10:25	IEA Energy Efficiency Market Report	Jeremy Sung, IEA Secretariat
10:25	10:45	DSM Task 25, Phase 2: Energy services supporting business models and systems	Ruth Mourik, Operating Agent Task 25
<b>10:45</b>	<b>11:15</b>	<b>Networking Break</b>	
11:15	11:30	DSM Task Proposal: Social License to Automate DSM	Tony Fullelove, Australian Delegate
11:30	11:45	DSM Task Proposal: Global Observatory on Peer-to-Peer, Community Self-Consumption and Transactive Energy models	David Shipworth, UK Delegate
11:45	12:25	D3A - An Energy Market Design for the Transactive Grid	Sarah Hambridge, Grid Singularity
<b>12:25</b>	<b>13:40</b>	<b>Lunch</b>	
13:40	14:20	Quartierstrom: Implementing and Testing a Local Electricity Market in the Real World	Verena Tiefenbeck/Lilian Ableitner; Bits to Energy Lab ETH Zurich
14:20	14:35	DSM Task Proposal: Energy-sector Behavioural Insights Platform	Sam Thomas, IEA DSM Operating Agent
14:35	15:10	Empower the consumer! The role of energy-related financial literacy	Massimo Filippini, Center for Energy Policy and Economics ETH Zurich
<b>15:10</b>	<b>15:40</b>	<b>Networking Break</b>	
15:40	16:00	DSM Task Proposal: Hard to reach energy-users	Sea Rotmann, Operating Agent
16:00	16:30	Examining community-level collaborative and competitive game mechanics to enhance household electricity-saving behaviour	Devon Wemyss, ZHAW Zurich University of Applied Sciences
16:30	17:00	An approach to boost the performance of heating craftsmen through «Nudges» in the context of energy efficiency program	Boris Reynaud, Services Industriels de Genève
<b>17:00</b>	<b>17:10</b>	<b>Questions &amp; Summary</b>	<b>SFOE</b>

16:30 – 18:30

Operating Agents Meeting

Bilateral Meetings with interested parties

Thursday 4 Ap

Thursday 4 April

09:00	<b>1. GENERAL BUSINESS/WELCOME</b>	
	<b>1a. Welcome – David Shipworth</b>	
	<b>1b. ExCo approval of the agenda – David Shipworth</b>	DOC A
	<b>1c. ExCo approval of the 52<sup>nd</sup> ExCo meeting minutes, ExCo Telco 12 December and February – Samuel Thomas</b>	Distr. earlier
	<b>1d. Actions from the 52<sup>nd</sup> ExCo meeting and December 2018 and February 2019 ExCo Teleconferences – Samuel Thomas</b>	DOC B
	<b>1e. Proposal for format of ExCo meeting Minutes – Samuel Thomas</b>	DOC C
	<b>1f. Status of the DSM TCP - David Shipworth</b>	
	<b>1g. International Energy Agency Secretariat news – Jeremy Sung</b>	DOC D
	<b>Coffee break</b>	
10:45	<b>2. TASKS</b>	
	<b>2a. Energy services supporting business models and systems (Task 25 – Phase2) - Task Status Report– Ruth Mourik, DuneWorks, Netherlands</b>	DOC E
	<b>2b. Operating Agents meeting report – Even Bjørnstad</b>	
	<b>2c. Global Observatory on Community Self-Consumption and Peer-to-Peer Energy Trading – Task Proposal – David Shipworth, United Kingdom</b>	DOC F
	<b>2d. Social Licence to Automate DSM – Task Proposal, Tony Fullelove, Australia</b>	DOC G
	<b>Lunch</b>	
13:30	<b>2. TASKS (continued)</b>	
	<b>2e. Hard to Reach Energy Users – Task Proposal, Sea Rotmann, New Zealand</b>	DOC H
	<b>2f. Behavioural Insights Platform – Revised Concept Note, Sam Thomas, ExCo Operating Agent</b>	DOC I
	<b>2g. Best Practices in Designing &amp; Implementing Energy Efficiency Obligations 2.0 – Jan Rosenow, Regulatory Assistance Project</b>	DOC J
	<b>2h. What's in an algorithm? Towards inclusive and user-centered development for energy optimization – Ruth Mourik, DuneWorks</b>	DOC K

**The proposed New Tasks discussion will aim at one of the following decisions:**

1. Decide to **initiate the new Task** based on work done to date.
2. Decide to initiate the **Task Definition** for a new Task. Interested countries must be prepared to assign the appropriate expert(s) to participate in that process.
3. Decide that additional work is needed on the **concept paper**. Interested countries must be prepared themselves, or to assign the appropriate Experts to help further develop the concept.
4. Decide to pursue the subject in co-operation with other parties within the IEA or elsewhere
5. Rejection (or moth-balling)

**Coffee break**

15:30 – 17:00 **3. STRATEGY**

3a. Strategic Plan 2020-2025 – David Shipworth DOC L

3b. New name for the TCP? – Facilitated discussion DOC M

*Friday 5 April* (ExCo only)

09:00 **3. STRATEGY (continued)**

3c. New name for the TCP? – Conclusion of facilitated discussion DOC M

**Coffee break**

11:00 **4. TCP MANAGEMENT**

4a. ESC report – David Shipworth DOC N

4b. Operating Agent report – Sam Thomas DOC O

4c. Draft communications strategy - Josephine Maguire DOC P

4d. Finance report – Even Bjørnstad PMD Part 2

4e. Finance sub-committee report – Even Bjørnstad, François Brasseur, Maria Buergermeister-Maehr, Simone Maggiore. PMD Part 2

4f. Updating the TCP's Implementing Agreement and Guidance – KC Michaels and Sam Thomas

4g. Updated Task guidance – Sam Thomas DOC Q

Lunch

13:30 **5. NEXT STEPS IN THE TRANSITION PROCESS**

5a. Actions over the next 6-12 months – David Shipworth

5b. Plans for the 54<sup>th</sup> and 55<sup>th</sup> ExCo meeting (October 2019 and April 2020) – Tony Fullelove (Australia), tbc

5c. Plans for ExCo teleconferences - Sam Thomas

5d. Contracting for an Operating Agent for 2020 to 2025  
– Contractor sub-committee oral update

DOC R

## 6. OTHER MATTERS

15:30 Meeting ends

### APPENDIX TO THE AGENDA “Issues for the decisions and the process to reach decisions”

**The delegates are URGED to prepare their responses to presentations carefully and primarily by contacting possible stakeholders before the meeting. The format for these proposed New Tasks will be a brief presentation that focuses on the:**

- **Motivation** for the proposed work (what issues does it tackle?) what is it trying to achieve? Who is the target audience?;
- **Objectives;**
- **Approach** to accomplishing the proposed work;
- **Expectations/Results and Deliverables**
- **Dissemination plan** – what will need to be done to get the results adopted? Who will do it?
- **Required resources**

#### **Concept and Task Definition Papers (Process and phases)**

Before a new Task is starting the concept has to be defined and presented in order to attain the interest of possible participants.

#### **PHASE 1: IDENTIFY NEW ACTIVITIES**

**Resulting in a CONCEPT PAPER (2-5 pages) containing**

- Motivation
- Objectives
- Approach
- Expectations/Results

#### **PHASE 2: DEFINE NEW ACTIVITIES**

**Requiring an EXPERTS MEETING to propose**

- Table 1. Task Work Plan Resource needs: Task or cost sharing  
Table 2. Dissemination, Task Information Plan

#### **CONTENTS OF PROPOSALS FOR NEW WORK**

The document that will propose the new work to the Executive Committee could be organized and have the

Following contents:

1. Background and motivation
2. Objectives
3. Issues for the new work (scope)
4. Structure (sub-tasks)
5. Management (responsibilities of the Operating Agent, Subtask leaders and Experts)
6. Deliverables (for whom, target groups)
7. Time Schedule and milestones
8. Funding and Commitments (Resources needed)
9. Meetings plan
10. Information activities
11. Co-operation with other IA's, the Secretariat and other interested parties
12. Country contributions to funding and Tasks

Annexes: Detailed description of Subtask

## ACTIONS EXCO TELCO 12 DECEMBER 2018

**Attachment B: Summary of Actions from 12<sup>th</sup> December 2018 ExCo Teleconference**

		<b>STATUS</b>
Action 20181212 - 1	The finance sub-committee will table a refined draft Terms of Reference for agreement at the April 2019 ExCo meeting.	DONE
Action 20181212 - 2	Even will prepare 2019 budget by early January 2019.	DONE
Action 20181212 - 3	The finance sub-committee will review budget documentation and work with Even to refine documentation by end January 2019.	DONE
Action 20181212 - 4	The finance sub-committee will review effectiveness of the new accounting structure and report back to the ExCo at the April ExCo meeting.	DONE
Action 20181212 - 5	The ExCo will vote on the move to a fee of €10 000 from 2020 at the April 2019 ExCo meeting.	ON-GOING
Action 20181212 - 6	ExCo delegates will provide written feedback to David and Sam, highlighting any important issues with respect to the language in the Strategic Plan.	ON-GOING
Action 20181212 - 7	ExCo delegates will continue to work with Task leads to bring new Task proposals to the April 2019 ExCo meeting.	DONE
Action 20181212 - 8	ExCo delegates will provide any feedback on the minuting proposal to Sam before, or at, the next ExCo teleconference, at which the item will be tabled for approval.	ON-GOING

## ACTIONS EXCO TELCO 22 FEBRUARY 2019

Attachment B: Summary of Actions from 22<sup>nd</sup> February 2019 ExCo Teleconference

		<b>STATUS</b>
Action 20190222 - 1	<b>Sam</b> to prepare examples of pre-Task support used by TCPs to inform discussion around the seed fund at the <b>Bern ExCo meeting</b> .	DONE
Action 20190222 - 2	<b>ExCo delegates</b> to find out what procedures would be necessary within their own internal organisations to change the legal text and supply information to Sam by <u>March 22<sup>nd</sup></u> .	ON-GOING
Action 20190222 - 3	<b>ExCo delegates</b> to complete the template circulated with the minutes setting out key words associated with the future of the TCP and, in rank order, potential new names and return to Sam by <u>March 11<sup>th</sup></u> . ExCo delegates may wish to refer to the draft Strategic Plan 2020-25 discussed on the previous teleconference (also circulated with the minutes).	ON-GOING
Action 20190222 - 4	<b>ExCo delegates</b> to send potential names to invite to tender for the role of facilitating the session in Bern to Sam by <u>February 25<sup>th</sup></u> .	DONE
Action 20190222 - 5	<b>ExCo delegates</b> to send Markus ideas for potential speakers for DSM Day, which is still two speakers short of a full agenda <u>as soon as possible</u> .	DONE
Action 20190222 - 6	<b>ExCo delegates</b> to book rooms at the Novotel in Bern before the DSM TCP reservation expires on <u>March 1<sup>st</sup></u> .	DONE
Action 20190222 - 7	<b>ExCo delegates</b> to send to Jeremy any ideas for case studies or data on the topic of digitalisation and energy efficiency.	ON-GOING

# ACTION ITEMS FROM 52<sup>ND</sup> EXECUTIVE COMMITTEE MEETING

2-3 October, 2018, London, United Kingdom

WHO	ACTION	WHEN
India, Spain	Pay <b>Common Fund</b> invoice for 2015, 2016, 2017,	NOT DONE
Australia, Belgium, India, Spain	Pay <b>Common Fund</b> invoice for 2018	Australia, Belgium paid India Span not paid
Sam Thomas ExCo Sub-committee	<b>2a. Nomination for Chair, contract for an OA</b>  <ul style="list-style-type: none"> <li>➤ <b>Sam</b> to prepare costed work plan within two weeks of the Executive Committee meeting</li> <li>➤ The <b>sub-committee</b> to form quickly to review Sam's work plan</li> </ul>	DONE  DONE
Sam Thomas	<b>3b. Task 16 Competitive/Innovative Energy Services</b>  <ul style="list-style-type: none"> <li>➤ Investigate the appetite amongst Executive Committee members and potential new members for new work on ESCOs</li> </ul>	ON-GOING
Sam Thomas	<b>3c. Task 25 Business Models for a more Effective Market Uptake of DSM Energy Services</b>  <ul style="list-style-type: none"> <li>➤ Propose updated guidance for the signing off of published reports by the TCP.</li> </ul>	DONE
Sam Thomas	<b>3d. Operating Agents meeting</b>  <ul style="list-style-type: none"> <li>➤ Include the issue of countries joining Tasks after they have begun, in updated draft Task guidance</li> <li>➤ Include management of the Twitter account as an option in the interim OA duties</li> <li>➤ Difficulty to upload documents to the DSM TCP website: Log as issue to be addressed once strategy has been agreed</li> <li>➤ Include text on task-sharing responsibilities in updated draft Task guidance</li> <li>➤ Include text on procedures in the case of non-payment in updated draft Task guidance</li> <li>➤ Include complaints procedures in updated draft Task guidance</li> <li>➤ Prepare options for Task review to discuss at next Executive Committee meeting</li> </ul>	DONE  DONE ON-GOING  DONE DONE DONE DONE
Sam Thomas	<b>4. Approach to new DSM TCP Tasks</b>	



	<ul style="list-style-type: none"> <li>➤ Draft updated guidance for new Task initiation, including key tests/questions for concept notes and proposals to address</li> <li>➤ Draft updated guidance for the sign off of published reports by the TCP</li> </ul>	<p>DONE</p> <p>DONE</p>
<p>Australia Ireland Netherlands Sweden United Kingdom United States Austria Belgium Finland Italy Norway Nova Scotia Switzerland RAP</p>	<p><b>5a. Concept paper on: Empowering automation</b></p> <ul style="list-style-type: none"> <li>➤ <b>Australia</b> (lead country) to organise an international meeting with Experts from the interested countries and submit the proposal before the next meeting.</li> <li>➤ <b>Supporting countries (Ireland, Netherlands, Sweden, United Kingdom, United States)</b> to ensure participation in the Task proposal development, including an international meeting (Task Definition Phase). <b>RAP</b> to feed in expertise.</li> <li>➤ <b>Interested parties unable to provide support at present (Austria, Belgium, Finland, Italy, Norway, Nova Scotia (through wider attempt to bring in Canada), Switzerland)</b> to investigate options for support to this Task’s development.</li> </ul>	<p>DONE</p> <p>DONE (largely)</p> <p>To some extent</p>
<p>United Kingdom Australia Netherlands Switzerland United States Belgium Ireland Italy Norway RAP</p>	<p><b>5b. Concept paper: Peer-to-peer Community Self-Consumption Observatory</b></p> <ul style="list-style-type: none"> <li>➤ <b>United Kingdom</b> (lead country) to organise an international meeting (Task Definition Phase) with Experts from the interested countries and submit the proposal before the next meeting, clarifying issues with respect to intellectual property and the relationship between the DSM TCP Chair and the Task Operating Agent.</li> <li>➤ <b>Supporting countries (Australia, Netherlands, Switzerland, United States)</b> to ensure participation in the Task proposal development, including an international meeting (Task Definition Phase). <b>RAP</b> to feed in expertise.</li> <li>➤ <b>Interested parties unable to provide support at present (Belgium, Ireland, Italy, Norway)</b> to investigate options for support to this Task’s development.</li> <li>➤ Full proposal to include a draft Intellectual Property agreement between parties.</li> <li>➤ Full proposal to identify, and include a governance structure that mitigates potential conflicts of interest between the Executive Committee proposer (UK) and the Task Operating Agent.</li> </ul>	<p>DONE</p> <p>DONE (Largely)</p> <p>To some extent</p> <p>DONE</p> <p>DONE</p>

<p>Ireland Australia Netherlands Austria Italy Norway Nova Scotia Switzerland United Kingdom United States RAP</p>	<p><b>5d. Concept paper: Behavioural Insights</b></p> <ul style="list-style-type: none"> <li>➤ <b>Ireland</b> (lead proposing country) to help organise an international meeting with Experts from the interested countries and submit the proposal before the next meeting.</li> <li>➤ <b>Supporting countries (Australia, Netherlands)</b> to ensure participation in the Task proposal development, including an international meeting (Task Definition Phase). <b>RAP</b> to feed in expertise.</li> <li>➤ <b>Interested parties unable to provide support at present (Austria, Italy, Norway, Nova Scotia (through wider attempt to bring in Canada), Switzerland, United Kingdom, United States)</b> to investigate options for support to this Task's development.</li> </ul>	<p>(Telco's: revised concept note submitted)</p> <p>DONE</p> <p>To some extent</p>
<p>New Zealand Sweden United States Austria Italy Nova Scotia IEA Legal</p>	<p><b>5e. Concept paper: Hard-to-reach Energy Users</b></p> <ul style="list-style-type: none"> <li>➤ <b>New Zealand</b> (lead country) to organise an international meeting (Task Definition Phase) with Experts from the interested countries and submit the proposal before the next meeting.</li> <li>➤ <b>Supporting countries (Sweden (subject to finding relevant expert), United States)</b> to ensure participation in the Task proposal development, including an international meeting (Task Definition Phase).</li> <li>➤ <b>Interested parties unable to provide support at present (Austria, Italy, Nova Scotia (through wider attempt to bring in Canada))</b> to investigate options for support to this Task's development.</li> <li>➤ <b>IEA Legal</b> to write to New Zealand to clarify the situation regarding their continued membership of the TCP and the contracting party for 2019.</li> </ul>	<p>DONE</p> <p>DONE</p> <p>DONE</p> <p>DONE</p>
<p>Sam Thomas ESC Anne ExCo members</p>	<p><b>6. Strategy to 2025</b></p> <ul style="list-style-type: none"> <li>➤ <b>Sam</b> to draft up new version of the Strategic Plan based on the decisions made at the Executive Committee meeting and circulate to the members.</li> <li>➤ <b>ESC</b> to bring a paper to the next Executive Committee meeting on options for a potential change of name.</li> <li>➤ <b>Anne</b> to set up an Executive Committee teleconference to discuss the new draft (and other issues) in early December (a second teleconference may follow in February).</li> <li>➤ <b>Executive Committee</b> members to communicate future strategic direction to networks for experts and potential collaborators.</li> </ul>	<p>DONE</p> <p>DONE</p> <p>DONE</p> <p>On-going</p>
<p>Even Bjørnstad Sam Thomas</p>	<p><b>7d. Finance update</b></p>	

	<ul style="list-style-type: none"> <li>➤ <b>Even</b> to clarify the work invoiced for by the TCP's advisor.</li> <li>➤ <b>Sam</b> to draft updated guidance around finance, including for invoicing by contractors.</li> <li>➤ <b>Even</b> to produce future years' budgets in advance of October Executive Committee meeting.</li> <li>➤ <b>Even</b> to produce a proposal for the next Executive Committee meeting (or an earlier teleconference) on the possible transition from US Dollar to Euro as the currency of the TCP, including for payments to the common fund.</li> <li>➤ <b>Sam</b> to explore with Executive Committee members the setting up of a finance sub-committee to consider financial procedures for managing common funds held at either the Executive Committee member or Task level.</li> <li>➤ <b>Sam</b> to clarify with IEA Legal the process for defining member countries as having inactive status and report back to the ESC.</li> </ul>	<p>DONE</p> <p>DONE</p> <p>DONE</p> <p>DONE</p> <p>DONE</p> <p>DONE</p>
ESC ExCo members	<p><b>7g. Updating the DSM TCP Implementing Agreement</b></p> <ul style="list-style-type: none"> <li>➤ <b>ESC</b> to work with IEA Legal between now and the next Executive Committee meeting to draft an update to the Implementing Agreement.</li> <li>➤ <b>Executive Committee members</b> to determine whom in their country has signing authority for alterations to the TCP Implementing Agreement.</li> </ul>	<p>DONE</p> <p>ON-GOING</p>
Task 16 Task 24 Task 25	<p><b>8.b DSM TCP Annual Report</b></p> <ul style="list-style-type: none"> <li>➤ Provide input to the 2018 Annual Report (a shorter version)</li> </ul>	<p>DONE</p>
Markus Bareit	<p><b>9a. Plans for the Fifty-Third Executive Committee meeting</b></p> <ul style="list-style-type: none"> <li>➤ Markus to confirm the date and location of the next Executive Committee meeting</li> </ul>	<p>DONE</p>
ESC ExCo members	<p><b>9b. Plans for the Fifty-Fourth Executive Committee meeting</b></p> <ul style="list-style-type: none"> <li>➤ <b>ESC</b> to work with Australia and Nova Scotia between now and the next meeting to ensure that a decision can be made in Switzerland on the venue for the October 2019 meeting.</li> <li>➤ <b>Executive Committee members</b> to check if they would be granted permission to travel to Australia for an Executive Committee meeting in late September or early October 2019.</li> </ul>	<p>DONE</p> <p>DONE</p>
Task 24 Task 25 Australia United Kingdom Ireland	<p><b>Input to Pre-Meeting Document for 53<sup>rd</sup> Executive Committee meeting</b></p> <ul style="list-style-type: none"> <li>➤ Prepare documents and send to Sam Thomas and Anne Bengtson for inclusion in the Pre-Meeting Document.</li> </ul>	<p>1 March Completed late, apologies</p>



New Zealand Sam Thomas Even Bjørnstad		
Sam Thomas Anne Bengtson	Send out Pre-Meeting Document	Circulated 15 March

## PROPOSAL FOR FORMAT OF EXCO MEETING MINUTES

This proposal sets out a streamlined version of future minutes of ExCo meetings. The aim would be to make them shorter and more accessible, meaning that they could be circulated more quickly, read by more attendees and agreed prior to the next meeting. Ideally they would be no longer than 10 pages long.

Page 1: **Attendees** (contracting parties; observers and OAs) including their country / affiliation and organisation.

Pages 2-5: The **minutes** themselves, which include numbered points, most of which are only one or two lines long. So a bit like our quick minutes. For example, for a particular Annex agenda item it reads like this [all things that could potentially identify this item removed, as 4E asked me not to share]:

[Title] Annex

1. [Name] presented an overview of the activities within the [Title] Annex.
2. The mid-term review has been completed as per the ExCo's recommendation in [date] and an updated workplan has been approved by the [Title] Annex Management Committee.
3. It was noted that the updated [important stuff] published in [date] followed a robust and transparent process, however [company name] and the [industry association] still publicly object to the [stuff]. The Annex will continue to try to engage with industry.
4. The Annex has received expressions of interest from [X] [organisations] from over [Y] countries in the new [Title] programme.
5. The ExCo accepted the Annex report and congratulated the Annex on its accomplishments.

Page 6: Attachment A - Progress with actions from the previous meeting.

Action Number	Action	Progress plus reference to agenda if appropriate.
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Note – “Progress with actions from the previous meeting” is an agenda item at the 4e ExCo meetings.

Page 7: Attachment B – List of Delegates, Alternates and Observers including email addresses.

Page 8: Attachment C – Summary of Decisions from meeting

Decision Number	Decision
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Page 9: Attachment D: Summary of Actions

Action Number	Action
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Page 10: Attachment E: Agenda

Time	#	Topic	Lead speaker	Action for ExCo	Paper ref
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### Matters for the ExCo:

- Approve the proposal for a new format for the Minutes

# REPORT FROM THE IEA SECRETARIAT 4<sup>TH</sup> QUARTER 2018

The IEA Secretariat report provides an overview of recent developments within the Energy Technology Network (ETN) and the IEA Secretariat that are of interest to all Technology Collaboration Programmes (TCPs). This report is designed to complement the information provided by your Desk Officer related to IEA analysis and projects (current and planned) of relevance to individual TCPs. If you have comments or questions, please forward to [TCP@iea.org](mailto:TCP@iea.org).

## IEA SECRETARIAT



South Africa joins the IEA family. South Africa joined the IEA family as its 8<sup>th</sup> Association country on 6 November. Among the agreements signed was a three-year joint programme of work identifying opportunities for collaboration on energy statistics, energy efficiency, electrification and power system transition, renewables integration, energy innovation, and domestic gas market design. [News article](#).

IEA and UK government kick-start a new global era for CCUS. The IEA and the UK government recently held a global summit on CCUS to identify practical steps to accelerate investment and deployment of CCUS. [News item](#), [Chair's Summary](#), new [IEA CCUS web page](#).



**IEA third global conference on energy efficiency. More than 200 energy professionals from over 60 countries gathered in Paris on 25-26 October to focus on the critical role that efficiency plays in the global energy transition, as well as opportunities that can be addressed. During the event, the IEA Executive Director also launched an [online platform for energy efficiency data and information](#).**

[News article](#); [workshop page with presentations](#).

### Update to the IEA energy efficiency indicators database

The IEA has updated its Energy Efficiency Indicators database with annual data from 2000 to 2016, with expanded geographical coverage and a new interactive visualisation tool. The database is available in two versions: [the short version is free](#) and contains total final energy consumption by end use for selected years, with the indicators indexed to the year 2000. The [extended version](#) is more comprehensive and includes the disaggregation of end use energy consumption by energy product, as well as end use efficiency and carbon indicators for all the years between 2000 and 2016.



### IEA at COP24

The IEA was very active, presenting and moderating at 45 events, 14 of which were organised/co-organised by the IEA on topics including electric mobility, air pollution, the IEA Sustainable Development Scenario, Tracking Clean Energy Progress, energy access, CCUS, buildings and energy-intensive industry.

### IEA workshop on hydrogen

The IEA is preparing a major new study to assess the state of play for hydrogen, its economics and future potential. A kick-off workshop will take place on 11 February 2019 in Paris and attendance is by invitation only. More information is available [here](#).



The IEA recently launched a twice-monthly newsletter called *The Energy Mix* which provides exclusive commentary, energy snapshots,

information on recent publications, upcoming events and more. To subscribe enter your email address on the

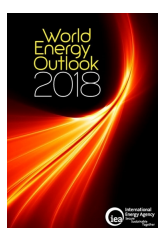
[IEA website home page](#):

Keep up-to-date with our latest news & analysis with our newsletter

Enter your email address...

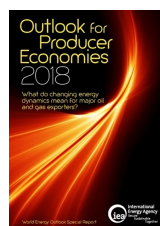
Subscribe

## IEA PUBLICATIONS



### **World Energy Outlook 2018**

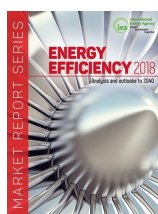
The 2018 edition of the [World Energy Outlook \(WEO\)](#) provides updated analysis to show what the latest data, technology trends and policy announcements might mean for the energy sector to 2040. It also outlines an integrated way to meet multiple sustainable development goals: limiting the global temperature rise in line with the Paris Agreement, addressing air pollution, and ensuring universal access to energy. Access the [Executive Summary](#), [video](#), [launch presentation](#), or purchase the [report](#).



### **WEO-2018 Special Report: Outlook for Producer Economies**

This special [free report](#) in the *World Energy Outlook* series examines six resource-dependent economies that are pillars of global energy supply: Iraq, Nigeria, Russia, Saudi Arabia, United Arab Emirates and Venezuela. It assesses how they might fare to 2040 under a variety of price and policy scenarios.

[Webinar](mailto:https://www.youtube.com/watch?v=p6daBIVTlwg&feature=youtu.be&utm_campaign=IEA+newsletters&utm_source=SendGrid&utm_medium=Email) [mailto:https://www.youtube.com/watch?v=p6daBIVTlwg&feature=youtu.be&utm\\_campaign=IEA+newsletters&utm\\_source=SendGrid&utm\\_medium=Email](mailto:https://www.youtube.com/watch?v=p6daBIVTlwg&feature=youtu.be&utm_campaign=IEA+newsletters&utm_source=SendGrid&utm_medium=Email)



### **Market Report Series: Energy Efficiency 2018**

This [free report](#) presents the most comprehensive [analysis](#) of current and future energy efficiency trends ever produced by the IEA, and its insights offer direct pointers to policy makers as to what policy solutions are available to deliver the economic, environmental and social benefits of energy systems that are as efficient as possible. [Webinar](#).



### **Market Report Series: Renewables 2018**, the annual [IEA market analysis and forecast on](#)

[renewable energy](#), takes an in-depth look at bioenergy, the largest source of renewable energy globally. In addition to looking at renewable energy across the entire energy system, the report provides a detailed market analysis and overview of renewables in the electricity, heat and transport sectors as well as forecasts for the period between 2018 and 2023. Access the [Executive Summary](#), [video](#), or purchase [the report](#).



### **2018 Global Status Report**

This [free report](#) documents the status and trends of key indicators for energy use, emissions, technologies, policies, and investments to track the buildings and construction sector, and highlights examples of how countries, cities, organisations and other stakeholders are already working towards sustainable buildings and construction.

## COMMITTEE ON ENERGY RESEARCH AND TECHNOLOGY (CERT)

As part of the 81st meeting of the CERT on 30-31 October 2018, the Secretariat organised a thematic session on energy innovation, to discuss IEA current and prospective work as well as to seek CERT guidance to ensure a systematic and co-ordinated approach to our efforts. The thematic session focussed on how IEA innovation data, indicators, analysis of technologies and investments, real-world solutions and key partnerships can support policy and decision makers globally to plan, implement, and monitor energy innovation efforts and strategies.

Importantly, this session provided an opportunity for CERT delegates to share experiences on national priorities and challenges for energy innovation, informing work across the Agency under Statistics and Data, Tracking Clean Energy Progress, Technology Collaboration Programmes (TCPs), the Clean Energy Transitions Programme (CETP), and cooperation with Mission innovation.

The next CERT meeting and workshop will take place in Paris on 12-14 February 2019 and will include a thematic session on clean energy materials in conjunction with CERT, Mission Innovation Challenge #6 and the participation of TCPs as relevant. The FPCC will also hold its annual meeting on 14-15 February.

### IEA Ministerial

The next IEA Ministerial meeting will take place in Q4 2019. Preparations have begun in the Governing Board and all IEA Standing Groups and Committees have been invited to provide input for topics to be discussed.

## WORKING PARTIES AND EXPERTS' GROUPS

### Working Party on Energy End-Use Technologies (EUWP)

On 31 October 2018 the CERT approved the extension of the EUWP mandate for the Period 2019-2021.

The 75<sup>th</sup> meeting of the EUWP will take place 20-22 March 2019 in Rome. Chairs of end-use TCPs will be invited to attend all meetings, and relevant TCPs will be invited to contribute to the one-day experts' workshop. The final report from the joint G20-IEA-IPEEC workshop on **Behaviour Change for Energy Efficiency: Opportunities for International Cooperation in the G20 and beyond**, held 12 September, is available on the IEA [website](#).

### Fusion Power Co-ordinating Committee (FPCC)

The concept, agenda and speakers for the FPCC strategic session on 14 February 2019 are now available for review on the IEA website. <https://www.iea.org/workshops/>.


### Working Party on Renewable Energy Technologies (REWP)

The October 2018 meeting of the **Working Party on Renewable Energy Technologies (REWP)** was hosted by Gestore dei Servizi Energetici (GSE) in Rome, and included a special session of the Renewable Industry Advisory Board (RIAB) on Africa's renewable energy transition. The next meeting of the REWP will take place in April 2019 in Paris (exact dates TBC).

### Working Party on Fossil Fuels (WPFF)

The 75<sup>th</sup> meeting of the WPFF was held in Paris on 19-20 December 2018. The meeting welcomed the re-appointment of two vice-Chairs, Mr Gunter Siddiqi (Switzerland) and Mr Vassilios Kougionas (European Commission) for further 3-year terms. The meeting included presentations on recent IEA reports, including the *World Energy Outlook*, *The Future of Petrochemicals* and *Coal 2018*. Thematic sessions included discussion of the nexus between fossil fuels and renewable energy; carbon capture, utilisation and storage





technology developments; and updates from the United States and European Commission. The next meeting of the WPF will be held in Beijing in Spring 2019.

**Experts' Group on R&D Priority-Setting and Evaluation (EGRD)**

The October 2018 EGRD workshop, **Future Energy Market Designs: Research and Innovation Needs**, highlighted the status of technologies, the need for new business models such as blockchain, and the lessons learned from regulatory sandboxes or living labs. The executive summary (2 pp) and summary report (12pp) of the May 2018 EGRD workshop, **Addressing the Energy-Water Nexus through R&D planning and policies**, are now available on the IEA [website](#).

# TECHNOLOGY COLLABORATION PROGRAMMES (TCPs)

## Webinar series on TCP legal topics

As part of the ongoing TCP modernization efforts, the IEA Legal Office hosted three webinars focusing on questions commonly asked by TCP representatives in the following topical areas:

**Webinar #1:**                      **October 18**                      **TCP Executive Committee Procedures**  
Quorum, written procedure, minutes,  
voting, etc.

**Webinar #2:**                      **November 15**                      **TCP Legal Structures**  
Operating Agents, Secretaries,  
contracting, etc.

**Webinar #3:**                      **December 17**                      **Communication Guidelines**  
TCP branding, use of IEA name & logo

Material from these webinars is available at the TCP Forum, including links to slides, video-recorded presentations, and FAQ documents. Please send any feedback and comments to [TCP.Legal@iea.org](mailto:TCP.Legal@iea.org).

## **TCP-related material appearing on the IEA website**



[Commentary: Carbon capture, utilisation and storage finally catches the spotlight.](#)



[News item: Chile's "Energia + Mujer" programme seeks to boost participation of women in the clean energy sector.](#)

[TCP activities, publications and events are regularly reported on the IEA website at \[www.iea.org/openbulletin\]\(http://www.iea.org/openbulletin\).](#)

[For information and suggestions please contact \[diana.louis@iea.org\]\(mailto:diana.louis@iea.org\)](#)

## **New or revamped TCP websites**

- TCP on Fluidized Bed Conversion <http://www.ieafbc.org/>
- TCP on the Stellarator-Heliotron Concept <http://www.ipp.mpg.de/sh-tcp>

## **TCP Participation: new Sponsors**



- Hydrogen Council
- Hychico, Argentina
- Reliance Industries Limited, India



- Universidad de la Costa, Colombia


- Limerick Institute of Technology, Ireland
- EURAC Research, Italy
- The Central Research Institute of Electric Power Industry, Japan
- Ricerca Sistema Energetico, Italy

## IEA SECRETARIAT – POINTS OF CONTACT FOR THE ENERGY TECHNOLOGY NETWORK

<b>Technology Collaboration Programmes</b>		
<a href="#">Uwe Remme</a>	ETSAP TCP	Cross-cutting
<a href="#">Cecilia Tam</a>	C3E TCP	Cross-cutting
<a href="#">John Dulac</a>	DHC TCP, ECES TCP, HPT TCP	End-use: Buildings
<a href="#">Brian Dean</a>	EBC TCP	End-use: Buildings
<a href="#">Luis Munuera</a>	HTS TCP, ISGAN TCP	End-use: Electricity
<a href="#">Kevin Lane</a>	4E TCP	End-use: Electricity
<a href="#">Jeremy Sung</a>	DSM TCP	End-use: Electricity
<a href="#">Araceli Fernandez Pales</a>	IETS TCP	End-use: Industry
<a href="#">Pierpaolo Cazzola</a>	AFC TCP, HEV TCP	End-use: Transport
<a href="#">Marine Gorner</a>	AMF TCP	End-use: Transport
<a href="#">Jacob Teter</a>	AMT TCP, Combustion TCP	End-use: Transport
<a href="#">Raimund Malischek</a>	CCC TCP, EOR TCP, FBC TCP, GOTCP	Fossil fuels
<a href="#">Samantha McCulloch</a>	GHG TCP	Fossil fuels
<a href="#">Carrie Pottinger</a>	CTP TCP, ESEFP TCP, FM TCP, NTFR TCP, PWI TCP, RFP TCP, ST TCP, SH TCP	Fusion power
<a href="#">Hideki Kamitataru</a>	Bioenergy TCP, Geothermal TCP, Hydrogen TCP, Hydropower TCP, Ocean TCP, PVPS TCP, SHC TCP, SolarPACES TCP, Wind TCP	Renewables & hydrogen
<b>CERT, Working Parties, Experts' Groups, and further advice for the ETN</b>		
<a href="#">Timur Guel</a> <a href="#">Simone Landolina</a>	Committee on Energy Research and Technology Co-ordinating cross-agency efforts on energy innovation, including through TCPs and other innovation partnerships	CERT TCPs
<a href="#">Carrie Pottinger</a>	Working Party on Energy End-Use Technologies	EUWP
<a href="#">Carrie Pottinger</a>	Fusion Power Co-ordinating Committee	FPCC
<a href="#">Paolo Frankl</a>	Working Party on Renewable Energy Technologies	REWPP
<a href="#">Samantha McCulloch</a>	Working Party on Fossil Fuels	WPFF
<a href="#">Carrie Pottinger</a>	Experts' Group on R&D Priority Setting and Evaluation	EGRD
<a href="#">Diana Louis</a>	Coordinating information on TCPs	TCPs
<a href="#">Claire Hilton</a>	Legal advice (TCP procedural and governance matters, including membership, requests for extension, reporting requirements and other documentation)	
<a href="#">KC Michaels</a>	Legal advice (modernisation of the TCPs' legal mechanisms; legal matters involving collaboration)	

### **New IEA Legal Office Email Address**

In line with the rebranding of Implementing Agreements as TCPs, we are updating the IEA Legal Office email address for TCP and Implementing Agreement matters. From now on, please direct all legal



queries to [TCP.Legal@iea.org](mailto:TCP.Legal@iea.org). The prior email address, [IMPAG.legal@iea.org](mailto:IMPAG.legal@iea.org), will continue to receive emails for the time being, but please update your address books!

## TASK 25 PHASE 2, ENERGY SERVICE SUPPORTING BUSINESS MODELS AND SYSTEMS

Operating Agent: Ruth Mourik, DuneWorks, Netherlands - [info@duneworks.nl](mailto:info@duneworks.nl)

### SUMMARY

This Task in a first phase focused on identifying existing business models and customer approaches providing EE and DSM services to SMEs and residential communities, analysing promising effective business models and services, identifying the role of national energy ecosystems in which these business models operate and provide guidelines to remove barriers and solve problems, and finally working together closely with both national suppliers and clients of business models.

The Task's research in phase 1 was not comprehensive, but did allow for the exploration and identification of interesting business models and strategies for energy efficiency focused services and how these could be supported by policy and or other institutional arrangements. What the Task accomplished thus far is just the starting point for understanding what the business models delivering energy efficiency services need to do to be successful, which sectors need what type of models, and what is needed from policy makers or other institutional players in terms of support. In sum, much more research and other activities are needed. This is why a second phase is planned.

What will we do?

The contours of matches between the Task's four business model strategies and specific sectors are emerging. To increase this understanding and keep up with the emerging trends a focus will be on new categories of energy efficiency business models and further developing potential effective business model strategies for these categories:

- Demand response energy services
- ICT and data driven energy services
- New actors driven energy services such as community energy, community VPPs, peer2peer
- Sufficiency and or circular energy services including renewables

The role of agencies, governments (i.e., context players) in stimulating market uptake of energy services, especially for smaller companies and co-create potentially more supportive policies and strategies with them. Participants will conduct a comprehensive analysis of which kinds of policy support would best support the four models and strategies we identified in phase 1.

One key finding from Phase 1 of Task 25 is that it is imperative to transfer the knowledge gained and the findings to the relevant actors in different countries and settings. And, simply communicating this information through a webinar or presentation is insufficient. This type of knowledge needs to be experienced and worked with in a real life setting, investigating real business models, real policies and real users. Therefore, the Task will set-up a strong training system, organize user centered business modelling interventions, involve end-users in a living lab setting, develop an online course (consisting of multiple webinars) in close cooperation with the DSM University as well as perform the more standard dissemination at conferences, in journals, etc.

## OBJECTIVES FOR THE LAST SIX MONTHS

This Task Phase 2 was approved at the Exco in Bergen-Norway in April 2018 and then contract negotiations started with all countries. The Task started May 2018, and will run until the ExCo in October in 2020, i.e. 30 months.

### Subtask 1: Task Management

Start date: month 1, end date month 30

#### Activities

- Overall project coordination and management, including contact relationship management
- Attendance of ExCo meetings, conferences and reporting to IEA DSM ExCo

#### Deliverables

- Half-yearly task status reports
- Annual reports

#### Progress

- The operating agent(s) have participated in the ExCo meeting in Bergen-Norway, and London in 2018 and presented both at the DSM day and at the ExCo
- A half-yearly task status report was written in September 2018 and in March 2019. An annual report was written for 2018.
- Several attempts have been made to involve further participants, e.g. Austria, Ireland. Ireland has now expressed the intention to join the Task.
- Italy has for the moment, because of budgetary issues, put participation in the Task on hold.
- A first Task expert workshop was held in London, a day before the DSM day.

### Subtask 2a: Increasing our comparison, including other categories of energy services

Start date or starting event: Month 1, End date: Month 24

#### Activities

1. Developing an overview (case analysis, literature review and interviewing) of existing energy service business models in the participating countries for the chosen categories.

#### Deliverables

The Dutch report on cVPP business models is ready, in the form of working paper. In addition this paper is translated into an invited book chapter for Elsevier. The chapter was accepted, a final draft is submitted March 15<sup>th</sup> and the book will be published later in 2019.

#### Progress

- A more concrete work plan and format for the shortlist and analysis was designed.
- Netherlands: an in-depth analysis of community energy, in particular cVPP project, business models was performed including a literature review on business models for new actors

driven/community energy services. This was performed in close cooperation with the INTERREG project cVPP.

- A first draft of the report is expected by the end of 2018
- Netherlands: a shortlist was set up for district heating and all electric projects and a selection of 6 cases is being analysed with a quick scan. Ready end of March 2019.
- Netherlands: a shortlist of circular/energy business projects was set-up
- Netherlands: workshops are being planned with companies focused on district heating and all electric, to be held before summer.
- Australia: a shortlist for VPP and community energy/microgrid projects was identified, and a context analysis is being performed.
- Sweden: a shortlist is being set-up for renovation projects and district energy projects. The context analysis is being updated.
- Ireland: first contacts were set-up with the national experts, a shortlist is to be presented at the task expert meeting in Bern.

## **Subtask 3a: Deepening our understanding of the actors and issues explaining the inertia of energy service uptake**

Start date or starting event: Month 1, End date: Month 28

### **Activities**

- 1 Investigating the different kinds of policy support that are available and what might be potential valuable support for the four models

### **Deliverables**

- None in this period

### **Progress**

- The literature review performed under subtask 2a is also used to investigate policy support available to the business models in the Netherlands.
- At the expert meeting to take place April 2<sup>nd</sup> 2019 in Bern, the national experts will be asked to provide a quick scan of these policy support measures and how they potentially impact the business models under investigation.

## **Subtask 4a: Training, engaging, disseminating**

Start date or starting event: Month 1, End date: Month 30

### **Activities**

1. Set up a training road show, with one training event per participating country and a training of participating country to enable them to give the training themselves.
2. Traditional dissemination to external stakeholders and academia

### **Deliverables**

- D9: Training road show
- D10: Outreach and dissemination material, including at least 2 academic/journal publications, MOOC, and other outreach material highlighting the Task's work.

## Progress to date

### Academic publications

- A paper on phase 1 results was submitted to the journal Renewable & Sustainable Energy Reviews
- We provided a chapter (accepted) to a book on energy democratisation, to be published later in 2019.

### Non-academic outreach

- Two spotlight articles were published: Spotlight March 2018 and Spotlight June 2018. The European Commission (paul Hodson) contacted us with a request for further information on the task, through twitter in response to the spotlight articles.
- In 2018 the EGRD published a report on the workshop held in the fall of 2017 called “Towards a Consumer-Driven Energy System. Understanding Human Behaviour” also highlighting the work of Task 25.
- We provided input on energy services to UNETOVNI as input to the Climate Agreement formation in the Netherlands
- The fall newsletter of Topsector Energie (TSE) published an interview with Ruth Mourik about the IEA work (published September 24<sup>th</sup>).
- We provided presentation material to be presented by our Vice Chair of the IEA DSM TCP at the G20 meeting in Paris, September 2018, and at a workshop on 'Behaviour Change for Energy Efficiency: Opportunities for International Cooperation' which will take place 12 September 2018 in Paris on the margins of the annual meeting of the Working Party on Energy End-Use Technologies (EWUP).
- In conjunction with a small project for the Dutch Innovation Agency Topsector Energie, Kennis Innovatie Urban Energy (TKI-UE) and MVI-E, Task 25 provided a training workshop at the TSE conference October 4<sup>th</sup> in the Netherlands for a mixed group of policy makers, entrepreneurs and researchers.

## EXPERT MEETINGS/SEMINARS/CONFERENCES

Date	Place	Participants	Type of meeting	Contribution	No. of attendees
April 2018	Ireland-Skype	NGOs, authorities, academia	INTERREG Community Virtual Power Plant Interreg project meeting	Presentation on Task 25	25
April 2018	Netherlands	DSO CEOs	Meeting with NetbeheerNederland	Presentation Task 25	3
April 2018	Netherlands	CEO and project manager	Dutch Association for Installers (UnetoVNI)	Presentation Task 25	2
June 2018	Aix-Les-Bains France	government, industry, academia	Sustainable Places conference, special workshop on user centered businessmodels organised by a consortium of projects (the H2020 project DrBoB, Task 25 and the H2020 Mobistyle project).	Workshop and presentation on Task 25	15
June 2018	Netherlands	RVO employees	lunchpresentation	Presentation IEA behaviour work	40
July 2018	Netherlands	Campaign team ministry Ecomic Affairs and Climate	presentation	Presentation IEA behaviour work	8
July 2018	Netherlands	CEO Buurkracht	Expert interview	Meeting	1
30 <sup>th</sup> september 2018	London	Task Experts	Task Expert meeting	meeting	10
October 4 <sup>th</sup>	Rotterdam	workshop	Interactive workshp on user centered business modelling	workshop	12



# OBJECTIVES FOR THE NEXT SIX MONTHS

The objectives listed below will be started but not finalised in the next 6 months.

## Subtask 1: Task Management

Start date: month 1, end date month 30

### Activities

- Overall project coordination and management, including contact relationship management
- Attendance of ExCo meetings, conferences and reporting to IEA DSM ExCo

### Deliverables

- Half-yearly Task status reports
- Annual reports

### Progress

- Participation in the Exco and DSM day
- Preparing the Annual Report for 2019 for Task 25

## Subtask 2a: Increasing our comparison, including other categories of energy services

Start date or starting event: Month 1, End date: Month 24


### Activities

2. Developing an overview (case analysis, literature review and interviewing) of existing energy service business models in the participating countries for the chosen categories, including all the deepening questions listed in the text earlier
3. Comparative analysis of business models in different countries. Further testing our hypothesis on the four strategies for both business model and context interaction, including all the deepening questions listed in the text earlier
4. Organising one country workshop with business representatives and other relevant stakeholders to discuss the cases, i.e in the Netherlands, and Sweden, Australia potentially to be done in conjunction with an exco meeting.

### Deliverables

D7: overview of business model strategies (business model, entrepreneurial capabilities and context stretch or fit actions) for each investigated sector or type of business, including a comparative analysis across countries.

## Subtask 3a: Deepening our understanding of the actors and issues explaining the inertia of energy service uptake



Start date or starting event: Month 1, End date: Month 22

**Activities**

- 2 Investigating the different kinds of policy support that are available and what might be potential valuable support for the four models
- 3 Organising a dialogue on a national scale on the system innovation failure and the role of different context stakeholders in setting up a more conducive context for service models.
- 4 Developing sector and business model type sensitive recommendations for policy makers and other institutional stakeholders where relevant.

**Deliverables**

- D8: Overview of the different types of policy and institutional support available to the different types of business models, where relevant country context and sector context sensitive. Including a national dialogue.

## Subtask 4a: Training, engaging, disseminating

Start date or starting event: Month 1, End date: Month 24

### Activities

3. Set up a training roadshow, with one training event per participating country and a training of participating country to enable them to give the training themselves.
4. Traditional dissemination to external stakeholders and academia

### Deliverables

- D9: Training road show
- D10: Outreach and dissemination material, including at least 2 academic/journal publications, MOOC, and other outreach material highlighting the Task's work.

### Planned outreach

- Based on the work for Task 25, we have been asked to provide a chapter in a book called "Energy and behaviours: Challenges of a Low-Carbon Future" to be published by Elsevier. The tentative title for the chapter is: "Democratising business models, energy services and community energy: best practices, challenges and opportunities."

## PLANNED EXPERT MEETINGS/SEMINARS/CONFERENCES

Date	Place	Participants	Type of meeting	contribution	Number of attendees
April 2nd 2019	Bern	Task experts and exco	meeting	lead	10
April 3rd 2019	Bern	mix	DSM day	presenter	?
June 11th 2019	Brussel	IEA involved	IEA Technical Day - IEA activities on energy in buildings and communities	Presenter?	?
June 2019	France	mix	Informal session at eceee summer school on the impact of context on radical energy business models	lead	30?

## OUTREACH

See the lists (performed and planned) under Subtask 4a.

# TIME SCHEDULE

## Timeschedule for last 6 months

month	7	8	9	10	11	12
month	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19
Subtask 1: Management of the task						
1.2 Exco meetings						X
1.3 Overall project management and financial and administrative duties						
Subtask 2a						
1. Identifying and selecting business models in participating countries						
2. Creating customer journeys						
3. In-depth comparative analysis						
4. Country workshop						
5. Reporting results						
Subtask 3a						
1. Investigating policy support types						
2. Developing sector and business model type sensitive recommendations						
Subtask 4						
1. Set up a training roadshow						
2. Developing a MOOC						
3. Set up an business model intervention involving real end users						
4. Traditional dissemination						

## Timeschedule for next 6 months

month	7	8	9	10	11	12
month	May 2019	June 2019	July 2019	August-19	sept-19	oct-19
Subtask 1: Management of the task						
1.2 Exco meetings						x
1.3 Overall project management and financial and administrative duties						
Subtask 2a						
1. Identifying and selecting business models in participating countries						
2. Creating customer journeys						
3. In-depth comparative analysis						
4. Country workshop						
5. Reporting results						
Subtask 3a						
1. Investigating policy support types						
2. Developing sector and business model type sensitive recommendations						
Subtask 4						
1. Set up a training roadshow						
2. Developing a MOOC						
3. Set up an business model intervention involving real end users						
4. Traditional dissemination						

## FINANCIAL MATTERS

Staff costs with 4 participating countries	140000	Hours 1600 (400 per paying country)
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Travelling + outreach materials	20000	
<b>TOTAL TASK BUDGET</b>	<b>Euro 160000</b>	

#### **Progress Budget**

- At the time of writing Sweden, Netherlands and Australia have paid the first invoices.
- Ireland needs to formally join.
- 

## **MATTERS FOR THE EXCO**

We would like to discuss how the ExCo can facilitate the organisation of Task meetings connected to the ExCo meeting, because of the international nature of the TCP and the difficulty of gathering international experts in between ExCo meetings.

## **IDEAS FOR NEW WORK**

See concept note

## **PARTICIPATING COUNTRIES**

1. Sweden (Sponsored by the Swedish Energy Agency)
2. Netherlands (sponsored by MVI-E)
3. Australia (sponsored by Monash University)
4. Ireland (SEAI), formal participation to be finalised

# GLOBAL OBSERVATORY ON PEER-TO-PEER, COMMUNITY SELF-CONSUMPTION AND TRANSACTIVE ENERGY MODELS

## EXCO SUMMARY

*History:* This Task was presented as a Concept Note in Bergen, approved for Task Development in London, and is requesting conditional approval to start in Bern

*Request for Conditional Approval:*

The Task requests ExCo approval conditional on: a) receipt of required National Participation Plans from at least two DSM participating countries; and b) identification of leads for the seven sub-tasks. This is in accordance with the DSM Implementing Agreement which states:

*“Each Annex shall enter into force at such time as the Executive Committee, acting by unanimity of those Contracting Parties which have communicated to the Executive Director a Notice of Participation in that Annex, determines that there is sufficient participation to perform the Task...”.*

*Status at 2019-03-01:*

The three most important sub-task leads have been secured. Florence School of Regulation (leading Policy and Regulation layer sub-task). US DOE SLAC lab and Stanford University (leading the Hardware, Software and Data layer sub-task). UCL (leading the Research design and management sub-task). Sub-task leader recruitment will continue during March. An update will be provided at Bern.

Bilateral and multilateral face to face and virtual meetings have been held with sub-task leads. These will continue during March.

*Resources:*

This is a pure Task-share proposal. The costs of the Operating Agent are met by UK Research and Innovation under the EnergyREV grant <[EP/S031863/1](#)>. All participant contributions are in-kind. The cumulative national total required time commitment is 6-person months per year. This can be from one or more National Experts in one or more institutions participating in one or more sub-tasks. The minimum required Policy Owner time is one day per year.

*Duration:* Three years + six-month reporting phase.

*Relationship to DSM Strategy:* The Task has an explicit secondary objective to increase national and sponsor participation in the DSM TCP. There is strong interest from National Experts in non-DSM TCP Countries including Germany, France, Denmark and Colombia, and expressions of interest from Israel, UAE and Saudi Arabia.

*Addressing ExCo requirements raised in Bergen and London:*

- The ExCo required that conflicts of interest be addressed. This is addressed in the section on Task Governance below.
- The ExCo required that IP be addressed. This is addressed in the section on Intellectual Property below

- The ExCo required that the task be structured to report results frequently. This has been addressed in the section on the Proposed Timeline below.

## TASK SUMMARY

The DSM TCP Global Observatory on Peer-to-Peer, Community Self-Consumption and Transactive Energy trading ('The Observatory') is an international forum for understanding the policy, regulatory, social and technological conditions necessary to support wider deployment of these market models. The Observatory's aim is to support all stakeholders in the peer-to-peer, community self-consumption and transactive energy fields through being technology-neutral and applying open innovation principles to pre-competitive and early-stage research. It brings together the leading organisations researching the design and implementation of such models across the world to draw lessons from the international comparison of field trials operating under different regulatory regimes and in different social and technical contexts. For policy makers and regulators, the Observatory will deliver learnings on the extent to which existing policies and regulations support or frustrate application of such models in their country, and how to design such systems to deliver different policy objectives while minimising potential adverse impacts. For businesses, lessons will be drawn on how the environment in different countries shapes the design and viability of possible business models. For researchers, the Observatory provides a route to research impact, a collaborative platform with business and government, and a global community of researchers. Findings will be designed for dissemination through IEA publications and global forums such as the Clean Energy Ministerial.

## AIMS


The DSM TCP Global Observatory on Peer-to-Peer (P2P), Community Self-Consumption (CSC) and Transactive Energy (TE) models aims to:

- To develop an international community of researchers and practitioners working on peer-to-peer, community self-consumption and transactive energy models within a pre-competitive environment to share best practices and inform the development of policy and regulation.
- Create an international forum for working collaboratively with government, regulators, industry and consumers to help establish the policy and regulatory environments needed to deliver economic and market reform supporting new local energy business models.
- To elicit policy makers' evidence needs for regulatory change in support of wider deployment of peer-to-peer, community self-consumption and transactive energy trading models in different regulatory regimes.
- To conduct a systematic study of the relationship between the design of peer-to-peer, community self-consumption and transactive energy model retail market structures and energy policy outcomes.
- To identify the factors leading to successful uptake of peer-to-peer, community self-consumption and transactive energy models in different contexts and embody these in a globally recognised 'Readiness Index' feeding into the IEA and the Clean Energy Ministerial.
- Disseminate findings through IEA publications and global forums such as the Clean Energy Ministerial.
- To bring new countries and sponsors into the DSM TCP

## RATIONALE AND TIMELINESS

To date there is no international forum for pre-competitive and early stage research collaboration into the whole systems implications of the community self-consumption, peer-to-peer and transactive energy trading market models. The Observatory aims to fulfil this need. It brings together the leading organisations researching the design and implementation of such models across the world to draw





lessons from the international comparison of field trials operating under different regulatory regimes and in different social and technical contexts. It is technology-neutral and applies open innovation principles to pre-competitive research, supporting all stakeholders in the peer-to-peer, transactive energy and community self-consumption fields. It is a time and scope limited international research collaboration between participating member countries of the DSM TCP.

While many of the practical applications of peer-to-peer and community self-consumption methods have been driven by technology companies, there is a rapidly growing body of academic research, and a nascent academic community studying the implications of these approaches for whole energy systems. Internationally, universities such as UNSW, Monash, Deakin and Curtin (Australia); Tsinghua (China); Universidad EIA (Colombia); DTU (Denmark); Panthéon Sorbonne (France); KIT and ESMT (Germany); FSR and EUI (Italy); TU Delft and Utrecht University (Netherlands); ETH Zurich and EPFL Lausanne (Switzerland) UCL, Bristol, Newcastle and Oxford (UK) Stanford and MIT (USA); and many others have growing teams of researchers working on community self-consumption. This covers both the development of transaction layers and trading platforms, energy systems components such as distributed generation, storage and energy management technologies, as well as cryptography, regulatory reform, and understanding the wider societal impacts.

China is implementing peer-to-peer trading mechanisms within its regions, the US, Australia, New Zealand and the UK are already well advanced in piloting schemes, and the EU has recently substantially changed its law in this area. The recently revised EU Renewable Energy Directive enshrines the right of European citizens to renewable self-consumption, including peer-to-peer energy trading. This is a significant global regulatory milestone. EU countries will have until 2021 to transpose it into their laws. The draft Directive defines peer-to-peer trading as follows:

*“Peer-to-peer trading” of renewable energy means the sale of renewable energy between market participants by means of a contract with pre-determined conditions governing the automated execution and settlement of the transaction, either directly between market participants or indirectly through a certified third- party market participant, such as an aggregator.” (Art. 2 (18))*

In advance of implementing the above Directive, France, Germany, Austria, Luxembourg and Spain have changed or are changing their laws to support community self-consumption.

# BACKGROUND ON PEER-TO-PEER, COMMUNITY SELF-CONSUMPTION AND TRANSACTIVE ENERGY TRADING MODELS

## Introduction

As we move towards increased reliance on renewable, distributed, intermittent energy sources, the successful integration of these resources into conventional centralised energy systems becomes increasingly challenging. To provide a functioning energy system in this context requires distributing balancing services close to the distributed generation to minimise bi-directional flows of energy over the distribution network. Doing so reduces network congestion, avoids expensive infrastructure upgrading, and increases network resilience.

Peer-to-peer energy trading provides one solution to this grid-edge management problem. This approach sees 'prosumers' buying and selling energy directly with each other. This is frequently facilitated by local energy storage and building energy management systems, using mechanisms that require little or no intermediary support from traditional actors in the energy system such as energy suppliers. Increasingly, such trading mechanisms are seen not only as providing a necessary balancing service in the energy transition, but also as a way of reengaging consumers and placing them at the heart of the energy system. The recent development of distributed ledger technologies, which can securely account for, and settle, transactions of energy over either local or long-distance networks has facilitated this growth in this area.

Retail energy markets are beginning to see this disruption in Europe, the US and Australia with models such as peer-to-peer energy trading presenting new ways to buy and sell energy (Mengelkamp et al., 2018; Morstyn et al., 2018). Factors such as market structure, local regulation, system constraints and consumer characteristics are all likely to be key determinants of ultimate social, energy system and business outcomes. However, without systematically synthesising findings emerging from such work it is difficult to recognise what benefits or risks emerge reliably as a function of intervention and context.

## Peer-to-peer trading: how it works.

Peer-to-peer trading can be realised in many ways – this section describes one implementation applicable to many liberalized energy market contexts. This entails treating the peer-to-peer participants as a 'balance group'. This balance group estimates its net position for the following day in the form of a 'balance schedule' - a 24-hour profile of net demand in time periods corresponding to the wholesale market. It then purchases enough energy from a supplier/aggregator in each period to cover their estimated requirements. Any imbalances (differences between projected and actual demand) are then settled through the System Operator's Balancing and Settlement system. This is illustrated through Figure 1 below.

Alternative market structures such as peer-to-peer could potentially pose an existential threat to traditional energy suppliers. While the extent of the threat is probably exaggerated, it could certainly change both their size and role in the energy system.

The primary economic function of energy suppliers in a deregulated energy market is to mitigate counterparty risk between the wholesale market and consumers. There is therefore likely to be an ongoing role for suppliers in mitigating the financial risk of settling imbalances on the wholesale market faced by smaller peer-to-peer markets. This is particularly the case where the peer-to-peer trading is occurring within a local community which may only have a few tens or hundreds of participants. Likewise, participants in the wholesale market are not going to want the cost, administrative complexities, and financial risk of default arising from dealing with large numbers of consumers and peer-to-peer balance groups. In this context, a supplier provides the legal framework, financial risk mitigation, and interface to the services of the wider energy system.

The other important role of suppliers however - that of providing a near universal service of an essential good, and (in many countries) delivering policy objectives related to energy poverty and maintaining priority services registers for those for whom loss of energy may be life threatening - will need to continue for the foreseeable future. There is a substantial risk with peer-to-peer energy trading of creating 'energy gated communities' of affluent, technology literate consumers for whom trading-off capital costs against operating costs is viable. Such communities could potentially push the cost of servicing the national infrastructure onto a decreasing body of those least able to afford it. This presents

important challenges for policy makers and regulators that will need to be addressed as the technology develops.

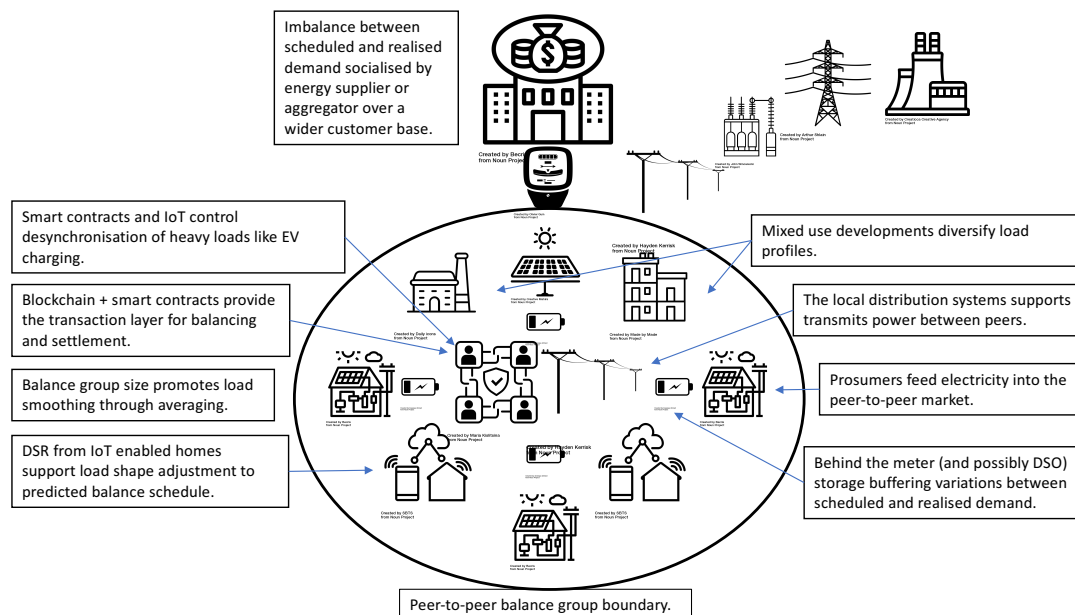


Figure 1: A peer-to-peer energy trading system designed to minimise imbalances

## Peer-to-peer energy trading challenges

### *Delivering policy/industry objectives.*

The design of a peer-to-peer energy trading scheme fundamentally determines the policy outcomes delivered. This, in part, is what drives the diversity of peer-to-peer schemes emerging from different providers. Systems can be designed to provide balancing at the grid edge to promote grid asset utilisation and efficient network management (e.g. Figure 1 above), or systems can be designed to drive uptake of PV and storage irrespective of their geographic location on the network. Over time, the desired outcomes will change as the physical and socio-demographic composition of different geographic areas evolve. This will unlimitedly require designing systems able to adapt as PV, EV or battery penetration increases, or as social expectations change around economic collaboration.

### *Social value stacking.*

Analysis from early peer-to-peer trials indicates that 'social value stacking', the addition of financial and non-financial consumer value propositions, is likely to be an important driver of consumer uptake for peer-to-peer trading schemes. Social value stacking entails identifying the social, psychological and financial value to consumers from participating in peer-to-peer schemes. Such social values include environmental value from local renewable energy consumption, creating opportunities for donating energy to local energy poverty charities, and potentially setting different prices for friends and family over providing frequency response services to the grid. Psychological values include increasing personal control, and a sense of autonomy from national infrastructure. Wider economic values include supporting the local economy by keeping value within the community, and identifying local synergies between social and commercial enterprises (say schools and local supermarkets) with complementary load and generation profiles. Maximising the social value stack requires tailoring peer-to-peer markets to individual communities by identifying combinations of values that drive uptake in each area.

## Policy and regulatory challenges

Peer-to-peer raises a multitude of challenges to existing policy and regulatory regimes. To illustrate these, an example of a challenge to success, and a challenge of success are presented below.

### *Policy challenges.*

A challenge to successful deployment of peer-to-peer lies in the unintended consequences of consumer protection and data privacy policies. These can impede the development of new models of consumers as engaging, either directly or indirectly, in multiple markets serving differentiated social values. A challenge of success is managing the distributional impacts arising from widespread uptake of peer-to-peer schemes. Uptake could lead to grid defection by ‘energy gated’ communities, this would push the costs of maintaining the network on those without the resources (financial, social and intellectual capital) to participate in such schemes.

### *Regulatory challenges.*

A challenge to successful deployment of peer-to-peer is prescriptive regulatory environments, frequently structured around an assumed one supplier per customer model, that stipulate actions rather than outcomes to deliver policy ends. A challenge of success will be responding to pressure from peer-to-peer prosumers and companies for demands for ‘user pays’ bases of Distribution Use of Service charges. These are currently flat components of consumers’ bills, but as grid use diminishes, and network traffic distances shorten, pressure will rise for reflecting use of system charges to reflect this. This will require balancing against the wider social benefits of national network infrastructure maintenance.

The energy system is undergoing an unprecedented period of change. As generation scale drops to kilowatts, and generation moves to roof-tops, transaction costs must fall to near zero to make balancing and settlement at the grid edge worthwhile. This requires disintermediating energy suppliers and financial institutions opening-up collaborative economic opportunities for peer-to-peer trading based on economic and social value stacking. Such schemes are necessarily tailored to the social, economic and physical characteristics of the area, and will need the flexibility to adapt as local circumstances change. Thus, if designed correctly, they offer the prospect of local, consumer and community centric energy systems solutions to grid-edge management in the context of the energy transition.

## **THE NATURE AND SCALE OF THE WORK**


The Observatory runs on a cycle of six-monthly reporting and planning meetings hosted by participating institutions and held in different countries. Between these meetings, participants collaborate on agreed research activities ranging from conducting primary international comparative research, through hosting side events at conferences, to the authoring of books, journal papers and reports. The two ‘Expert Meetings’ per year are run over two days. Day one is an International Symposium featuring the work done in the Task, along with presentations of related work by academics in the country hosting the Task meeting. Day two is for working meetings of the Task participants, ensuring progress against deliverables agreed with the IEA DSM Executive Committee.

It is anticipated that the Observatory will ultimately include 8 to 12 countries, each contributing 6 to 10 active participants. The Observatory may therefore represent the collective work of around 60 global experts. They will collaborate over a three-year period, holding six International Symposia and contributing between 8 to 12 person years, equating to over €1M of coordinated global research.

An outline of the proposed scope of work is provided below.

## **LOGICAL STRUCTURE OF ACTIVITIES**

1. **Define the scope** of what we mean by peer-to-peer, community self-consumption and transactive energy models.
2. **Targeted literature reviews** identifying current key factors in each sub-task influencing design of P2P/CSC/TE business models.
3. **Agree appropriate tools for analysis** for international comparative analysis of case based data (such as Qualitative Comparative Analysis (QCA)).
4. **Elicit policy makers’ and regulators’ evidence needs** to ensure the outputs of the Task are as useful, as used, and as impactful as possible.
5. **Identify the key factors on which case-study data is needed in each sub-task area.** See below for sub-tasks.

- 
6. **Development of methods and templates for collection of case study data.** This is to ensure that data from case studies are collected in a consistent manner within and across member countries.
  7. **Identify and undertake relevant case-studies in each participating country.** Establish contact and collect relevant data.
  8. **Undertake international comparative analysis** based on the case-study data using an appropriate analytical framework.
  9. **Identify common factors across cases** that are required for successful adoption.
  10. **Write policy focused reports within each sub-task domain on key issues for successful adoption** of peer-to-peer, community self-consumption and transactive energy models.
  11. **Develop a national 'Readiness Index'** from the common success factors that can ideally be derived from publicly available national data in a wide range of countries.
  12. **Conduct bi-annual Task meetings in different member countries,** in which findings from different national teams are presented and which support the development of wider research communities in these countries.
  13. **Report to bi-annual DSM TCP ExCo meetings** on the work of the Task.
  14. **Report to the IEA and providing input to IEA publications** such as the Energy Efficiency Market Report and information portals such as the IEA [Global Exchange on Efficiency](#) to maximise impact.
  15. **Prepare final Task report to the DSM TCP** on the factors governing uptake of peer-to-peer and related models.

## RESEARCH METHODS

Firstly, a systematic review of existing literature on community self-consumption, peer-to-peer energy trading and related models will be conducted. This will cover the academic literature and grey literature and will apply a theory-driven systematic review framework (Pawson & Tilley 1997 & 2004) and systematic evidence review methods (Grant & Booth, 2009). While outside the scope of the formal systematic review, alternative media sources such as podcasts, videos, and social media will also be drawn upon. This work will be complemented where appropriate with the use of expert elicitation through semi-structured interviews to help develop a more complete picture of developments in this rapidly changing field.

Secondly, a set of global case studies of community self-consumption, transactive energy and peer-to-peer energy trading will be conducted in all participating member countries through primary field-work (i.e. assessing of existing pilots/trials). Case studies will form the core of the work. These will be multidisciplinary and multi-method – drawing on expertise of teams in each country comprised of engineers, social scientists and policy analysts.

Thirdly, a synthesis of findings from these case studies. More general findings will be derived through application of the Qualitative Comparative Analysis. QCA is a method designed to fill the gap between the contextual richness and depth of individual case studies, and the need for general lessons learnt which is traditionally the realm of quantitative survey methods. QCA typically draws general influential factors from the analysis of dozens of individual cases and allows for wider lessons to be learnt regarding the comparative importance of common contextual factors found in different regulatory or social environments.

In 'Innovative Comparative Methods for Policy Analysis', Rihoux (2006) outlines a range of different, and in some cases complementary methods for the conduct of international comparative analysis that can support application of QCA. These include:

- MSDO/MDSO (Most Similar Different Outcome/Most Different Same Outcome). This helps find causal links in a set of case studies and can be useful for causal links mapping before QCA analysis.
- Realistic Evaluation. This uses 'Context-Mechanism-Outcome (CMO) Configurations' to find the contextual conditions that make policy interventions effective, therefore developing lessons about how they produce outcomes, in order to inform policy decisions. This can be useful for theory development before QCA analysis.
- Event-structure analysis. This is designed to map out a chain of events from an initial trigger to an eventual outcome and can help address the lack of a time dimension in QCA.

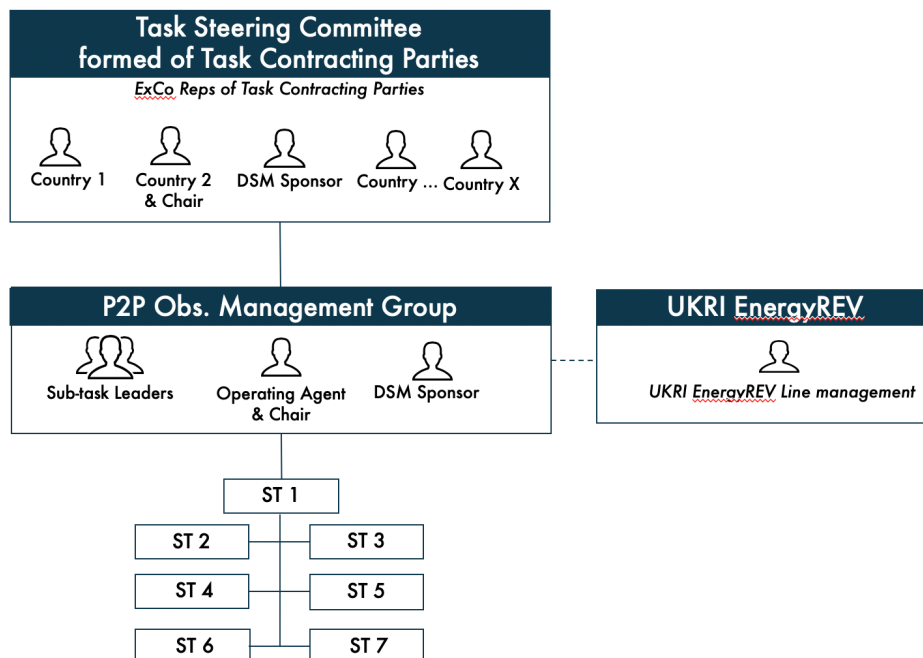
Because of its capacity to draw out the comparative importance of common contextual factors across a range of different regulatory and social environments, QCA naturally lends itself to the construction of readiness indices. Methodologically, QCA, it shares common features with methods historically used in the construction of readiness indices such as Fuzzy Analytical Hierarchy Process (used for the construction of indices for knowledge management integration (Sadeghi *et al* 2013; Padhi & Mohapatra 2011) as well as approaches based on principal components analysis (used for the construction of e-Government readiness indices and measures of health service readiness (Jackson *et al* 2015; Ayanso 2011). Each of these methods is used to reduce high dimensional data sets into a subset of common factors which explain most of the areas of commonality between the sets of cases used in their construction.

The Task will undertake a review of methods for the construction of readiness indices, but it is initially anticipated that the 'Truth Table' and the process of application of Boolean minimisation used in QCA will form the basis of a distance metric for each country from the causal recipes (sufficient conditions) needed for adoption of these models. Various metrics (e.g. Hamming distance or Euclidian distance metrics) can then be constructed to assess how many changes each country needs to make to achieve sufficient conditions for application of these business models.

# TASK GOVERNANCE

The proposed governance structure of the task is shown in Figure 1 below. This consists of a Task Steering Committee, a Task Management Group, and Sub-task leads. The Task Steering Committee is formed of ExCo members who are the Task Contracting Parties. The Task Steering Committee will meet every three months. These will be physical meetings coinciding with ExCo meetings and will be TelCos for the intervening meeting. While normally the ExCo's Task Sponsor (in this case the UK) would chair this Steering Committee, because the ExCo Task Sponsor secured the funding for and therefore employs the Task Operating Agent, it is proposed that another member chairs the Steering Committee. The Task Sponsor will also sit on the Task Management Group along with the Task Operating Agent, and the Sub-task leaders. The Task Management Group will meet every six weeks. These will be physical meetings when coinciding with Task meetings and will be TelCos between these.

The ExCo highlighted the potential for conflicts of interest in the ExCo Task Sponsor employing the Task Operating Agent. This management structure, and the 100% Task-share arrangement seeks to address these concerns. There is no financial conflict of interest for the ExCo, and through securing funding for the Task OA, the ExCo Task Sponsor's interest are aligned with those of the ExCo and the OA through being contractually obliged to the UK Funder to deliver the project. The Task Operating Agent therefore also reports to this funding body through the grant's Executive Committee.



**Figure 1:** Task Organogram

# TASK ROLES AND RESPONSIBILITIES

## Responsibilities of the Task Steering Committee (TSC)

The Task Steering Committee is responsible for the overall Governance of the Task including approving any alterations to the plan of work consistent with achieving the overall initial stated aims of the Task. It will be responsible for ensuring that the Task remains consistent with the TCP's overarching strategy and that ongoing planning and operational decisions are made effectively, openly and appropriately. The Task Steering Committee will meet quarterly by TelCo with the Task Management Group between ExCo meetings. The TSC will guide the Task in avoiding duplication with activities of other related programs and projects implemented by or under the auspices of the Agency or by other competent bodies.

## Responsibilities of the Task Management Group (TMG)

The Task Management Group is responsible for the ongoing operational management of the Task. It will meet by TelCo every six weeks between TSC meetings. It will be responsible for supporting the Operating Agent in developing and implementing a suitable project management system and develop an overarching program of work to the satisfaction of the Task Steering Committee. It will oversee the preparation of, and distribute, the key findings of the Task.

## Responsibilities of the Operating Agent (OA)

The Operating Agent is responsible for the overall management of the Annex, including overall coordination, liaison between the Subtasks, and communications with the Executive Committee. In addition, the Operating Agent shall:

- Work with Task participants in preparation of reports and deliverables.
- In conjunction with the Participant from the nation hosting the meeting, ensure each Task meeting is suitably chaired, and be responsible for developing the agenda and producing minutes.
- At the request of the Executive Committee, participate in workshops, seminars, conferences, and other meetings.
- Provide, reports to each Executive Committee meeting on the progress and results of the work performed under the Program of Work.
- Provide to the Executive Committee, within six (6) months after completion of all work under the Task, a final report for its approval and transmittal to the Agency.
- Provide the Participants with the necessary guidelines for the work to be carried out under the Subtasks, for the reports to be made, and for information to be distributed.
- Perform such additional services and actions as may be decided by the Executive Committee, acting by unanimity.

## Responsibility of the Sub-task leaders

- Be a member of the Management Group
- Provide intellectual and project leadership in the subject area of their sub-task.
- Host one Task meeting, including accompanying international symposium, during the course of the Task.
- Identify publication and dissemination opportunities including running sessions at relevant conferences, coordinating or contributing to journal special issues, providing input to publications of the IEA and other relevant international bodies, etc.

## Responsibility of Participants

*The responsibilities of the National Experts (NEs) include:*

- Support development of the Task Work Plan;
- Support the organisation of Task meetings and symposia in their home country;
- Attend other participating countries' expert workshops,
- Present the work of the Task at international conferences and workshops;
- Manage and lead country-specific research efforts, identifying and analysing case studies;
- Provide the OA with feedback and information on the results of the work carried out by their work;
- Provide contribution to the content and reviewing of all draft reports of the Task;
- Support the OA in disseminating the results of the work, including among their own networks.

# THE RESEARCH STRUCTURE AND SUB-TASKS

The primary aim of the Observatory is to learn through international comparative analysis what policy, regulatory, technical, social and economic factors are needed to support emergence of peer-to-peer and community self-consumption business models. This will be done through analysis of case studies in the form of trials in different countries. To support the core activity of analysing and comparing cases, a range of sub-tasks are needed to ensure the outputs are relevant to policy makers and regulators, and



that data collection from the cases is done using methods that are applied consistently and support established best-practice analysis methods for international comparative studies. It is envisaged that all participants will be involved in collecting data from case studies in their own country, as well as participating in the sub-tasks of their choice outlined below. The sub-tasks are based on the functional stacking of elements needed to understand how peer-to-peer/community self-consumption/transactive energy models work in different environments.

The functional stack needed to understand and deploy peer-to-peer/community self-consumption/transactive energy models contains the following elements (layers). These are reflected in the structure of the sub-tasks (ST) which make up the Observatory. In addition, there are sub-tasks for research design and management (ST-0), and for the analysis of the findings using Qualitative Comparative Analysis (QCA) and construction of the Readiness Index (ST-6).

- The power system integration layer
- The hardware, software and data layer
- The transactions and markets layer
- The economic and social value layer
- The policy and regulatory layer

While this is not an exhaustive list of relevant factors (for example it does not address issues such as potential skills shortages or non-energy environmental impacts), represents sufficient conditions for implementing peer-to-peer and related business models.

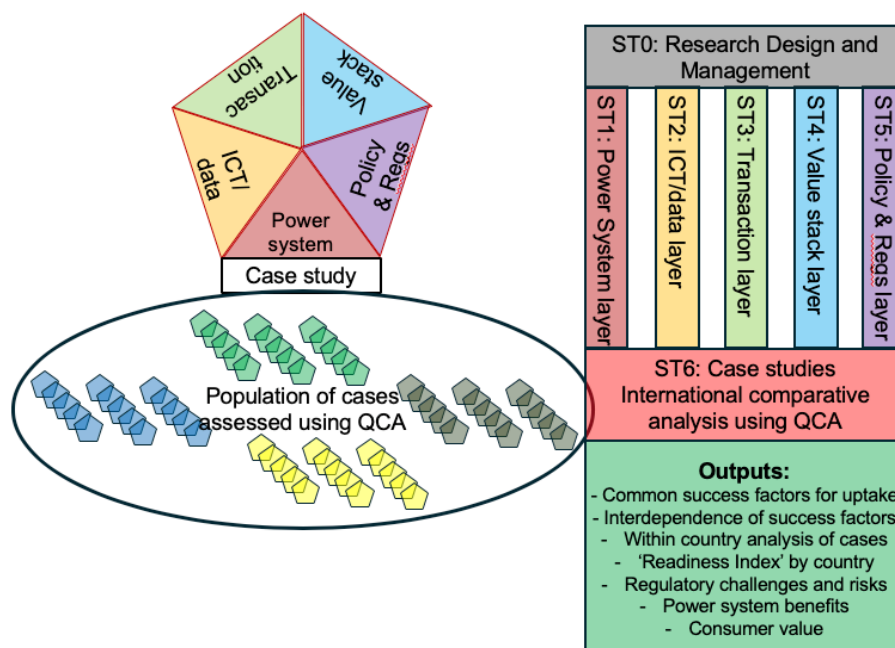


Figure 1: The structure of the programme of work.

## DELIVERABLES

D #	Month	Deliverable details	Type
1	1->6	<p><b>Name:</b> <i>Concept mapping and scope definition</i></p> <p><b>Research Question(s):</b> How do different countries define P2P/CSC/TE trading?</p> <p><b>Rational:</b> A common definition is needed for selection and analysis of case studies.</p> <p><b>Description:</b> Output assessing how P2P/CSC/TE are defined in different</p>	Policy briefing note + conference and/or journal paper

		countries and providing a working definition for use in the Task.	
2	1->6	<p><b>Name:</b> <i>Policy epistemology report</i></p> <p><b>Research Question(s):</b> What evidence is needed to inform policy and regulation in different countries?</p> <p><b>Rational:</b> Outputs will have greater impact if presented in a format most useful to policy makers and their existing policy making processes.</p> <p><b>Description:</b> International comparison of policy makers' and regulators' evidence needs. Identifying both the type and format of evidence required to inform policy.</p>	Policy briefing note + conference and/or journal paper
3	1->6	<p><b>Name:</b> <i>Research Design master document.</i></p> <p><b>Research Question(s):</b> What methods are best for delivering defensible evidence of the type most useful for policy makers?</p> <p><b>Rational:</b> Well designed and defensible research has more uptake and impact.</p> <p><b>Description:</b> Report reviewing methods for international comparative analysis; development of readiness indices; templates for collection of case study data; etc.</p>	Task Report (academic outputs where suitable)
4 – 8	1->15	<p><b>Name:</b> <i>Sub-task layer targeted literature reviews &amp; 'Key Factors' reports</i></p> <p><b>Research Question(s):</b> What are the key factors in each sub-task layer constraining or shaping the design of P2P/CSC/TE business models?</p> <p><b>Rational:</b> It is necessary to identify the key environmental (technical, social, economic policy &amp; regulatory) factors shaping the design of, or supporting/constraining uptake of, P2P/CSC/TE business models in each country.</p> <p><b>Description:</b> Literature reviews identifying current key factors in each sub-task area influencing design and implementation of P2P/CSC/TE business models.</p>	Conference and/or journal papers & Policy briefing notes.
9	7->30	<p><b>Name:</b> <i>P2P/CSC/TE case book</i></p> <p><b>Research Question(s):</b> <b>N.A.</b></p> <p><b>Description:</b> Compilation of case studies used in the international comparative analysis. Reference resource for further study.</p>	Website content
10	13->33	<p><b>Name:</b> <i>Key factors governing uptake of P2P/CSC/TE business models</i></p> <p><b>Research Question(s):</b> When assessed globally, what common factors can be identified for each sub-task layer that support or inhibit uptake of P2P/CSC/TE business models?</p> <p><b>Rational:</b> Providing lessons to country policy makers on factors governing uptake of these models.</p> <p><b>Description:</b> International Comparative Analysis using Qualitative Comparative Analysis or comparable method of common environmental (technical, social, economic policy &amp; regulatory) factors supporting or constraining uptake of P2P/CSC/TE business models.</p>	Policy briefing note + conference and/or journal papers
11	16->33	<p><b>Name:</b> <i>National Readiness Index.</i></p> <p><b>Research Question(s):</b> How ready is each participating country for adoption of P2P/CSC/TE business models? Which factors are limiting adoption? What are the key changes needed to promote adoption?</p> <p><b>Rational:</b> Governments need to evaluate what changes they could choose to make to increase the likelihood of adoption of P2P/CSC/TE business models. Companies need to evaluate which markets are most ready for implementation of these models.</p> <p><b>Description:</b> Publication of an international comparative report on the readiness of different countries to adopt P2P/CSC/TE business models broken down by key factor and technology stack (i.e. sub-task) layer.</p>	Online publication + Journal Publication(s) + input to IEA publications
12	42	<p><b>Name:</b> <i>Final Task report</i></p> <p><b>Research Question(s):</b> <b>N.A.</b></p> <p><b>Description:</b> Final Task report to the DSM TCP on the factors governing uptake of peer-to-peer and related models</p>	Task DSM ExCo and IEA reports

# PROPOSED TIMELINE

The Task will be managed using agile methods to produce useful outputs throughout its life. There will be three broad phases: Establishment (M1-6); Iterative development and review (M7-33); Project closedown (M33-42)

## Phase one: Task Establishment (M1-6)

The aim of Phase One is to establish the necessary research architecture to ensure robust, policy relevant, research is undertaken. Three main tasks will be done in parallel during this Phase:

- Developing the research design
- Undertaking concept mapping and scope definition
- Undertaking policy epistemology interviews
- Start sub-task targeted literature reviews

## Phase two: Iterative development and review (M7-33) (9 3-month 'sprints')

The proposed process for Phase Two for developing the case studies and extracting common factors will be done using an 'agile' approach. This would use quarterly reviews aligned with the Task Steering Committee meetings.

These would involve the Steering Committee reviewing identified key factors at the sub-task level, as well as case studies and the application of QCA to these to draw out collective common factors.

These would include:

- Presentation of current findings from the Sub-task layer targeted literature reviews (M1-15 only)
- Presentation of compiled case studies done to date to be used in the international comparative analysis. (M7-30)
- Presentation of findings from the application of Qualitative Comparative Analysis for international comparative analysis of the common technical, social, economic policy & regulatory factors supporting or constraining uptake of P2P/CSC/TE business models. (M13->33)
- Presentation of the current findings on the readiness of different countries to adopt P2P/CSC/TE business models broken down by key factor and technology stack (i.e. sub-task) layer (M16-33)

## Phase three: Project closedown (M34-42)

- Finalisation of the P2P/CSC/TE case book, Readiness Index, completion of documentation, preparation of Task final report, archiving of evidence base, etc.

## Task Gantt Chart

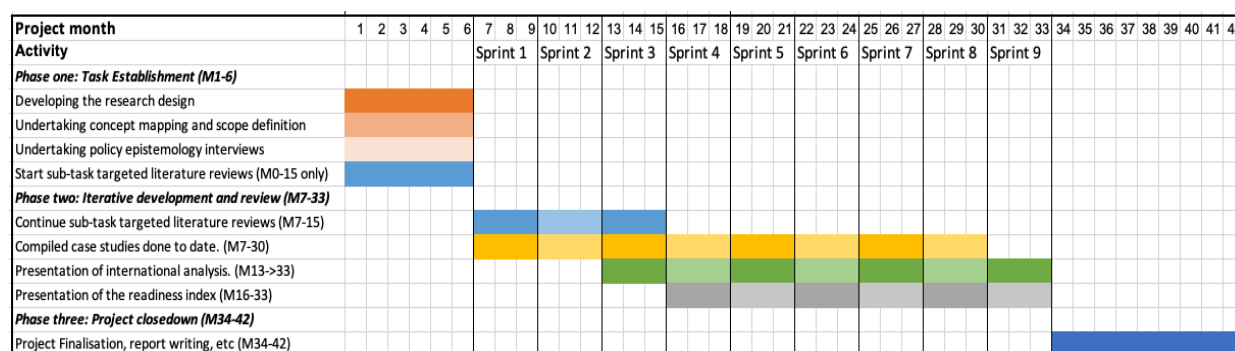


Figure 2: Task high-level Gantt chart

## Sub-task 0. Research design and management (Subtask lead UK – UCL)

<b>Start</b>	Month 1
<b>End</b>	Month 42
<b>Activity</b>	Develop the Research design for the Task as a whole Provide operational project management for the Task.
<b>Deliverables</b>	<i>D1 - Concept mapping and scope definition report</i> <i>D2 - Policy epistemology report</i> <i>D3 - Research Design master document</i> <i>D12 - Final Task report</i>

Sub-task 0 will provide the following functions to the Task.

### ***Overall project management including:***

- Schedule physical meetings (2 per year): timing and location, including identifying key conferences these may coincide with (e.g. EventHorizon).
- Agree methods of working (e.g. collaboration tools, such as Slack).
- Agree key outputs (books, special issues of journals, policy briefings, collaborations with other bodies such as EWF, WEF, OECD, EC, etc.).
- Establish protocols for contact with case studies.
- Developing templates for any collaboration and non-disclosure agreements.
- Providing guidance on securing research ethics approval where needed.
- Establish Research Data Management protocols and permissions.
- Coordinating sub-task outputs.

### ***Facilitate overall research design including:***

#### *Defining scope*

- Definition of P2P/CSC/TE systems. What are the characteristics of systems we want to include in the analysis?
- Eliciting policy makers' and regulators' requirements
- Policy epistemology: Identify methods for eliciting the forms of knowledge most useful for policy makers and regulators in different countries. Identify what evidence can they use to change their regulatory regimes. These could include semi-structured interviews; Delphi processes, social surveys, etc.
- Identify ways of resolving differences in policy makers' and regulators' needs by country, reconciling the need for consistency of methods across countries for international comparison purposes, with the need for national differentiation.
- Identify appropriate methods with which to identify the wider social benefits of P2P/CSC/TE models including realist review of existing cases, semi-structured interviews with lead organisations and participants, etc. This will include addressing key policy relevant questions including:
  - Is it desirable to quantify these benefits and if so, how could this be done?
  - Can social benefit be captured without being (fiat) monetised?
  - How can social value be used in the construction of business models?
  - What are the multiple benefits of P2P/CSC/TE models?
  - What is the social value stack that can be created through these models?

## Sub-task 1. The power system integration layer (Subtask lead TBC at 2019-03-01).

Sub-task leads to be approached include: TU Delft; ETH Zurich; EPFL; DTU

<b>Start</b>	Month 1
<b>End</b>	Month 36
<b>Activity</b>	Evaluate the benefits for the grid of P2P/CSC/TE energy markets. Evaluate the key enablements and constraints arising from existing and likely future power system architectures and technologies.
<b>Deliverables</b>	<i>D4 - Sub-task layer targeted literature reviews &amp; 'Key Factors' reports - power system integration</i> <i>D9 - P2P/CSC/TE cases - power system integration sections</i>

Proper power system integration is a necessary condition for the success of any new market model. P2P/CSC/TE models provide a range of services to the power system from grid edge balancing to incentivising uptake of Distributed Energy Resources (DERs). Any model that creates more power system problems than it solves is unlikely to be accepted. Understanding the value to the power system is important for finding out both the financial and social value of such models.

Particular challenges arise in understanding the characteristic timescales related to the various forms of grid constraints that peer-to-peer, community self-consumption and transactive energy models can address. These timescales in turn determine the balancing and settlement period needed if the market structure is to provide grid benefits in alleviating these constraints.

Understanding the electro-mechanical grid components governing power flow is essential in designing market mechanisms that provide grid benefits.

This sub-task will assess the evidence on issues including for example:

- Understanding how different configurations of P2P/CSC/TE models create value or challenges for power systems.
- Understanding how the nature and mix of Distributed Energy Resources deployed including generation assets, storage, and controllable demand impacts on the design of local energy markets.
- Understanding the types of controllers and actuators deployed, from grid supply points, through primary and secondary substations, to end use technologies including energy management systems for buildings and vehicles.
- Assessing the power system priorities (local balancing services; decarbonisation of supply; security of supply; increasing system resilience; etc.).
- The treatment of imbalances in day ahead and market closure periods between the P2P/CSC/TE participants and the grid.
- Determining the power-system characteristic time periods of grid constraints – from transformer relaxation, to thermal line limits, to frequency limits and higher harmonic anomalies that may govern the grid benefits of P2P/CSC/TE models settling at different periods. How short does the settlement period need to be to align the transaction layer with the physics of the grid?

## Sub-task 2. The hardware, software and data layer (Subtask lead: USA SLAC/Stanford University)

<b>Start</b>	Month 1
<b>End</b>	Month 36
<b>Activity</b>	Evaluating the role of the hardware, software and data ontologies on the functioning of P2P/CSC/TE energy markets. Evaluate the key enablements and constraints arising from existing and likely future ICT solutions.
<b>Deliverables</b>	<i>D5 - Sub-task layer targeted literature reviews &amp; 'Key Factors' reports - hardware, software and data</i> <i>D9 - P2P/CSC/TE cases - hardware, software and data sections</i>

The digitalisation of the power systems is a necessary condition for successful decentralisation and bidirectional energy flows at the grid edge. Current grid data systems from substation Remote Terminal Units to Supervisory Control and Data Acquisition (SCADA) systems, have not delivered the levels of information needed to understand bidirectional energy flows at the grid edge.

In addition, the data needed to provide market ready evidence of demand response behind the meter in the timescales and with the reliability needed to form the legal basis of contracts on short-term energy markets is frequently lacking in current grid environments. In many countries deployment of smart-metering infrastructure is insufficiently advanced, and the meters lack the functionality, to support peer-to-peer, community self-consumption and transactive energy trading models.

Recent advances in new ICT technologies such as Internet of Things devices, distributed ledger technologies and the development of hardware crypto-anchors offer new opportunities, but these need careful assessing to understand the constraints they place on development of these new market structures.

This sub-task will assess the evidence on issues including for example:

- Do existing metering assets deployed in countries have the reliability and temporal resolution needed to support peer-to-peer, community self-consumption and transactive energy models.
- Does existing energy ICT support deployment of virtual metering and M&V (measurement and verification) solutions for Distributed Energy Resource authentication including demand reduction.
- How peer-to-peer, community self-consumption and transactive energy models ready are existing types of ICT grid asset hardware including sensors and actuators, dataloggers, and information processing equipment ICT (in addition to standard metering).
- Do the algorithms for controlling devices exist and are they interoperable across the necessary asset classes?
- Do current models used for providing forecasting and counterfactuals of short-term demand and quantification of demand response exist, and if so do they provide the accuracy needed for individual peer-to-peer, community self-consumption and transactive energy trading participants to control storage assets such as behind the meter batteries and vehicle to grid storage?

## Sub-task 3. The transaction and markets layer (Subtask lead TBC at 2019-03-01)

<b>Start</b>	Month 1
<b>End</b>	Month 36
<b>Activity</b>	Assess the architecture of the transaction layer for recording balancing and settlement of imports and exports. Evaluate the impacts of the design of P2P/CSC/TE energy markets on performance of the system.
<b>Deliverables</b>	<i>D6 - Sub-task layer targeted literature reviews &amp; 'Key Factors' reports - transaction and markets</i> <i>D9 - P2P/CSC/TE cases - transaction and markets sections</i>

Sub-task leads to be approached include: London Business School; European School of Management and Technology; Karlsruhe Institute of Technology.

Built on top of the ICT layer, the transaction layer allows for functioning markets for balancing and settlement at the grid edge. The design of this layer is central to how P2P/CSC/TE markets function and the social and economic benefits to participants.

Currently, few studies have been conducted on how the design of the market interacts with the physical flow of electromagnetic waves on the grid, and how the response to market signals actuates electromechanical devices control such power flow. The design of markets must take into account these spatial and temporal grid constraints if they are to deliver policy objectives of deferring substantial investment in grid infrastructure renewal.

Market design must also reflect policy priorities on incentivisation of other social goods such as incentivising uptake of renewable generation. Correct market design could provide an alternative to feed-in tariffs to promote uptake of distributed renewables. Market design therefore becomes a key instrument in determining which policy priorities are achieved and much acknowledge that alternative priorities may be conflicting.

An additional consideration is how market design should evolve as the number of participants, and the number of generation and automatable demand side response assets increases during the energy transition. It is likely that initial implementation of peer-to-peer, community self-consumption and transactive energy models will need to deal with small numbers of participants creating problems of illiquid markets. As participant numbers grow, market structure and functionality can change as markets clear more easily and become more efficient. This question of balancing and settlement in an evolving energy transition places particular challenges on transaction layer and market design.

This sub-task will assess the evidence on issues including for example:

- Assessing the architecture of the transaction layer for recording balancing and settlement of imports and exports, including use of distributed ledgers.
- The design of peer-to-peer, community self-consumption and transactive energy models energy markets.
- The implications for balancing and settlement of energy including of different settlement periods and how this alleviates different grid constraints.
- The design of illiquid markets with small numbers of participants and how these should evolve with increasing numbers of actors and assets.
- The design of algorithms for automated trading by participants and the interaction with the evolution of smart contracts on Distributed Ledger systems.

## Sub-task 4. The economic and social value layer (Subtask lead TBC at 2019-03-01)

(Subtask lead TBC: Options: Aust. UNSW; USA - Perdue)

<b>Start</b>	Month 1
<b>End</b>	Month 36
<b>Activity</b>	Evaluate the construction of consumer value propositions based on economic and social value. Evaluate how the 'choice architecture' of P2P/CSC/TE models impacts on participant engagement and outcomes.
<b>Deliverables</b>	<i>D7 - Sub-task layer targeted literature reviews &amp; 'Key Factors' reports - economic and social value</i> <i>D9 - P2P/CSC/TE cases - economic and social value sections</i>

Understanding consumer value(s), both economic and social, is essential to the design of P2P/CSC/TE markets. The design of such values has to be built into the choice architecture of the propositions offered to consumers and will ultimately have a big impact on the popularity and functioning of such markets.

Evidence from existing studies shows that consumers participate in peer-to-peer, community self-consumption and transactive energy trading for a range of reasons in addition to, or sometimes overriding, least cost energy options. Business models vary from efficient market platforms, through corporate social responsibility, to differential pricing for friends and family, to charitable given to support those in energy poverty.

This sub-task will assess the evidence on issues including for example:

- Evaluating the construction of consumer value propositions based on reducing energy price. This includes design of non-punitive market designs that ensure participants cannot be worse off than on a conventional tariff.
- Evaluating social value propositions including psychological values (e.g. autarky) and social (e.g. communitarian and interpersonal) values and their use in business model construction.
- Identifying ways to capture and represent the non-energy social value of P2P/CSC/TE models such as increasing social cohesion; participant desire for autonomy; reducing energy poverty; increasing social capital; etc. This includes identifying what socially valuable options should be designed into the choices presented to participants, e.g. donation of energy to energy poor neighbours, differential pricing for friends and families, options to support local social institutions such as schools, etc.
- Psychological models (the participants' value proposition), including assessing how does the 'choice architecture' of P2P/CSC/TE models impact on participant engagement. This includes how the design of the user interface influences participation.
- Understanding how default settings in interfaces impact on the degree of participation including default settings of pro-economic, pro-social and pro-environmental default values.
- Assessing if social-psychological rewards should be engineered into the design of the system, e.g. social validation for energy trading, etc. This includes application of social norm and other behavioural economic influences.



## Sub-task 5. The policy and regulatory layer (Subtask lead: EUI-FSR)

<b>Start</b>	Month 1
<b>End</b>	Month 36
<b>Activity</b>	Identify the impact of policy and regulation on the uptake of peer-to-peer and associated models. Identify the key characteristics of the regulatory environment that support or inhibit their implementation
<b>Deliverables</b>	<i>D8 - Sub-task layer targeted literature reviews &amp; 'Key Factors' reports - policy and regulation</i> <i>D9 - P2P/CSC/TE cases - policy and regulatory sections</i>

Policy and regulation have been repeatedly identified as some of the limiting factors on the uptake of P2P/CSC/TE models. This work package aims to understand the impact of policy and regulation on the uptake of these models. It will seek to identify the key characteristics of the regulatory environment that support or inhibit their implementation.

This sub-task will assess the evidence on issues including for example:

- What are the key regulatory bodies and regulations that have an impact on the implementation of P2P/CSC/TE models?
- How are relevant areas of regulation structured and how interdependent are they?
- What are the policy objectives that P2P/CSC/TE models could address?
- What are the distributional impacts of implementing P2P/CSC/TE models?
- How are the capital costs of national infrastructure like electricity grids socialised?
- What is the current structure of taxes and charges for use of electricity networks and how does this impact on uptake of P2P/CSC/TE models? (e.g. a charge for use (e.g. kWh/km), a capacity charge (€/annum), or as a social good from general taxation?)

It will seek to address key regulatory questions across multiple sectors such as:

- Energy sector regulation
  - Which elements of regulation need reform? Do they sit with the regulator or the code bodies? Who has the authority to make changes? What are the governance processes for effecting change? Is (the right to) peer-to-peer energy trading and energy self-consumption recognised in energy law? Are prosumers and energy communities legally recognised?
- Data privacy regulation
  - What information about energy use and equipment can be shared publicly? How is pseudonymization treated in data privacy regulation? How technology agnostic is the legislation?
- Consumer regulations
  - How are prosumers treated in consumer law? What protections are given to purchases of energy in P2P schemes? What liabilities should they be exposed to?
- Contract law
  - How does existing contract law impact on use of smart contracts (in the case of blockchain) for energy trading?
- Land-use, planning and property ownership
  - What planning permission is needed to install generation and storage equipment? What is the structure of legal ownership of property and how does this impact on decisions to install equipment in common areas of multi-tenant property?

## Sub-task 6: International Comparative Analysis and the Readiness Index (UCL-All)

<b>Start</b>	Month 13
<b>End</b>	Month 33
<b>Activity</b>	Lead on conducting the International Comparative Analysis using Qualitative Comparative Analysis Lead on constructing the Readiness Index
<b>Deliverables</b>	<i>D10 - Key factors governing uptake of P2P/CSC/TE business models</i> <i>D11 - National Readiness Index</i>

This task aims to synthesize findings from the case studies mentioned above in a methodologically defensible and useful way. The initial intention is to use Qualitative Comparative Analysis. QCA is a method designed to fill the gap between the contextual richness and depth of individual case studies, and the need for general lessons learnt which is traditionally the realm of quantitative survey methods. QCA typically draws general influential factors from the analysis of dozens of individual cases, and allows for wider lessons to be learnt regarding the comparative importance of common contextual factors found in different regulatory or social environments.

QCA has particular advantages in cross-country comparisons because of its ability to treat individual countries holistically as historically, culturally, politically unique entities with meaningful combinations of parts, instead of trying to make these countries fit single models. The researcher is urged not to specify a single causal model that fits the data best, as one usually does with statistical techniques, but instead to determine the number and character of the different causal models that exist among comparable cases.

QCA comes in three primary forms: crisp-set (csQCA); fuzzy-set (fsQCA); and multi-value (mvQCA). Of these, multi-value QCA works best with the number of cases (50-100) anticipated to be collected in this Task. It allows use of multi-state ordinal variables (e.g. high, medium & low) where these values represent the extent to which a single category is present in a given case, not whether a specific category of a condition is present. This provides it with an important advantage over both crisp set (csQCA) and fuzzy set QCA (fsQCA).

The output of the application of mvQCA will be an understanding of the relationships and interdependencies between the power-system, policy and regulatory, social and economic as well as environmental conditions supportive of the uptake of P2P/CSC/TE models in different countries.

Building on the findings from the application of QCA a peer-to-peer and related business models 'Readiness Index' will be constructed. The methods for this are covered in the Research Methods section above. The readiness index will be applied to each Task participating member country across each of the sub-task layers of the technology stack. The result will be a measure of number of changes needed for a country to have the sufficient conditions to implement peer-to-peer, community self-consumption and transactive energy models.

The final research design and analysis of cases will evaluate which combination of these methods provides the most useful evidence to policy makers.

## TASK RISK REGISTER:

Description	Likelihood	Impact	Risk pre-mitigation	Mitigation	Risk post-mitigation
Financial	Nil.	Nil.	Nil.	100% Task-share	Nil.
Policy Owner (PO) time overrun	Medium	Medium	Medium	Define minimum required PO time to be low (~1 day/year) – with additional contributions at PO's discretion	Low
National Expert time overrun (over commitment on deliverables and failure to deliver)	High	Medium	High	Build strong core teams around core deliverables in sub-tasks. Build additional contributions as modular and at NE's discretion.	Medium
Conflict of interest between Task OA and DSM ExCo Country sponsor (UK) working together.	Low (Interests are aligned – not conflicting)	Medium	Medium	Create governance structure so that DSM ExCo Sponsor is not the Chair of the Subcommittee of Task Contracting Parties	Low
Inability to recruit suitable National Experts	Medium	High	High	Secure global leading sub-task leaders.	Medium
Additional requirements from countries joining late.	High	low	Low	Clear stipulation of national contributions required, and clear cut-off dates for later entry.	Low
Conflict of interest between UK National Funder's goals and DSM TCP goals	Low	Medium	Medium	DSM ExCo Country sponsor sits on grant Steering Committee. High profile of Task reduces likelihood of conflict.	Low

# INTELLECTUAL PROPERTY

The Task Operating Agent and Participants shall take all necessary measures to protect proprietary information and provide adequate protection against unauthorised disclosure, copying or use by other Participants as well as third parties.

Proprietary information shall be understood as meaning information of a confidential nature such as literary, artistic and scientific works, that i) is not generally known or publicly available from other sources; ii) has not previously been made available by the owner to others without obligation concerning its confidentiality; iii) is not already legitimately in the possession of the recipient without obligation concerning its confidentiality.

All Intellectual Property rights accorded to a data set by a data provider, including before the start of the Task, shall at all times remain the property of the provider. Any Intellectual Property rights generated in Task outputs such as deliverables, materials and publications shall be held by the author(s).

It shall be the responsibility of each Participant supplying proprietary information to identify the information as such and to ensure that it is appropriately marked. Participants will share obtained data internally in accordance with agreements with third-party data providers, such as in a Licence stipulating the terms of use of supplied data.

The publication, distribution, handling, protection and ownership of information and Intellectual Property provided under or arising from the Task shall be determined by the Executive Committee, acting in unanimity.

These obligations shall continue to be applied for a period of five (5) years after the termination/expiry of the Task.

## INFORMATION FOR TASK PARTICIPANTS

Participation requires commitment at both the country and institutional level. Countries must be members of the DSM TCP - paying a national subscription fee and committing to provide some in-kind support and management oversight of DSM TCP activities through sitting on the DSM TCP Executive Committee. Institutions must commit in-kind resources (largely staff time) to participate. Companies can participate by joining the DSM TCP and paying the same annual subscription fee as countries.

**Country participation:** The Observatory will be established as a 'Task' under the International Energy Agency (IEA) Demand Side Management Technology Collaboration Programme (DSM TCP). As such it is regulated by the DSM Policy and Procedures Guidelines and the Implementing Agreement (the legal basis on which the TCP is established by the IEA). For institutions in a country to participate (e.g. universities), their country must be a member of the DSM TCP. For information on joining please contact the DSM TCP Chair, Prof. David Shipworth at UCL in the first instance. Country membership currently costs €10,000/annum, which enables countries to attend Executive Committee meetings and participate in all Tasks. There is no additional fee for participating in the P2P Observatory Task.

**Company participation:** Companies can participate by joining the DSM TCP as sponsors. Company membership currently costs €10,000/annum, which enables companies to attend Executive Committee meetings and participate in all Tasks. The company would then join the steering committee for the Observatory and could attend Observatory meetings and contribute expert input to the work of its sub-tasks.

**Institutional participation:** The majority of the work will be done by research institutions in DSM TCP member countries. To participate, institutions must be granted permission by their government representative on the DSM TCP Executive Committee. Collectively, within a country, institutions must commit in-kind staff time equivalent to a minimum of six person-months per annum for three years. There is no upper limit on participation. Person-time contributions can be made up from multiple researchers within one institution, or contributions from multiple institutions. Ideally, this person time would be closely aligned with existing nationally funded research activity to which the activities of the Observatory are closely aligned and can add value.

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# SOCIAL LICENCE TO AUTOMATE DSM

## SUMMARY

The DSM TCP (Demand Side Management Technology Collaboration Programme) Social License to Automate will be a task that analyses leading automated DSM projects to understand key social, organizational, economic and regulatory determinants of successful customer engagement, implementation and transitions of institutional regimes. Participating countries will document how end-user trust to automate is built and maintained across different national contexts.

## CONTEXT

As policy and market drivers of decarbonisation accelerates the uptake of distributed energy resources (DER), the need for rapid electricity system responsiveness to the variability of wind and solar supply and variable demand increases. To leverage the full capacity of this growing, but highly distributed resource, requires real-time automation access to the energy sources situated within residential and small-scale commercial systems. Without automation, demand side management (DSM) is unlikely to provide the electricity system with the fast-acting response needed to manage changing network and system requirements.

In liberalized energy markets automation of DSM is usually assumed to be opt-in, delivering direct customer value (which may not be a financial reward) as well as network and system-wide benefits of managing peak loads. By examining contemporary practices and programs (e.g. policy inventions) associated with advancing DER adoption and operation in a broad range of contexts, this TCP will establish robust insight into the ingredients for building and maintaining trust between DER owners and those seeking to automate.


The term Social License is a shorthand for the trust between participants and affected communities in an industrial project. The concept has historically referred to the relationship between mining and wind farm project proponents<sup>1</sup> but has expanded to other fields, such as health. The concept of Social License was adopted to describe how technologies are received in a socially relevant site.

This TCP will build country profiles upon leading examples of DSM automation practices to elicit a more generic framework regarding how to advance DER within energy systems. Part of the challenge of building social license between automation service providers and owners of DERs lies in the deep distrust that energy users exhibit towards corporate energy industry entities<sup>2</sup>. Thus, at the household scale, it is naïve to expect customers to explicitly agree to automation systems reaching behind the meter to access the customer's equipment to provide third party services. Customers that do not trust the electricity industry to act in their personal interest may not be the only party to hesitate to make the

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<sup>1</sup> Prno, J., & Slocombe, D. S. (2012). Exploring the origins of 'social license to operate' in the mining sector: Perspectives from governance and sustainability theories. *Resources policy*, 37(3), 346-357.

<sup>2</sup> Goulden, M., Bedwell, B., Rennick-Egglestone, S., Rodden, T. & Spence, A. (2014) Smart Grids, Smart Users? The role of the user in demand side management. *Energy Research and Social Science*, 2: 21-29.



accommodations required for DSM to flourish; established participants such as distribution networks, retailers and regulators may be wary of the wholesale changes implied. This TCP will therefore examine how trust is built and maintained where automation has occurred

## **AIMS AND OBJECTIVES**

This task proposes to develop a guiding framework that captures insights from global experiences of implementing automated DSM. Given this area of practice is in its infancy, this cluster of work will review both scholarly and contemporary empirical examples, related to household practices, policy interventions and practitioner perceptions, among others, to identify key ingredients to assist in expediting the transition towards integrating more DER.

We anticipate this will identify key emerging research in social sciences, technology and policy to investigate customer barriers and drivers for the uptake of other similarly challenging consumer-facing technologies, to ensure that the regulatory and commercial environment created by policy and industry actors is conducive to delivering network and system-wide benefits.

The objective of the DSM TCP task on Social License to Operate is to:

- Co-design a template for data collection and analysis regarding trusted automation of DSM, that is, to isolate key variables in how and why a social License for the automation of DSM is granted by users.
- Identify and examine major trials associated with automated DSM in each participating country (e.g. detailed case studies exploring the internal dynamics of how new practices are being supported, maintained and replicated)
- Understand how social value and trust is developed and maintained across the industry, including the utility (demand side operator or retailer), aggregator or other participants.
- Understand how energy automation features should be presented to consumers and how much transparency and control should be granted to different groups of customers
- Examine the institutional arrangements (e.g. policy, rules and regulation and governance mechanisms) associated with the trials of DSM practices.
- Generate a guiding framework regarding how socio-technical and socio-institutional arrangements (i.e. contracts, regulation, policy interventions, device architectures and human-computer interfaces, user engagement, and household composition) may underpin the development of a Social License to Automate and to identify what is required beyond the technology.

## **LINKAGE TO DSM TCP P2P OBSERVATORY**

This Task links directly to the proposed Observatory on Peer to Peer, Community Self Consumption and Transactive Energy models (P2P Observatory). We aim to share case study participants across tasks to maximise value and minimize disruption to case study proponents. Particularly given Sub-task 4 of the P2P Observatory investigates the influence of consumer value, especially social value; thus, direct links exist between the tasks.

## LOGICAL STRUCTURE OF ACTIVITIES

The structure of activities mirrors that of the P2P observatory in the development of a shared definition, collection of data, analysis and dissemination of findings.

16. **Define the scope** of trusted automation.
17. **Review the literature in each of the sub-task** to identify current knowledge in each area and produce landscape reviews.
18. **Agree appropriate tools for analysis** for international comparative analysis and benchmarking of case-based data (such as Qualitative Comparative Analysis)
19. **Elicit policy makers' and regulators' evidence need** to ensure the outputs of the Task are as useful, as used, and as impactful as possible.
20. **Identify the key factors on which case-study data is needed in each sub-task area.** See below for sub-tasks.
21. **Development of methods and templates for collection of case study data.** This is to ensure that data from case studies are collected in a consistent manner within and across member countries.
22. **Identify relevant case-studies in each participating country.** Establish contact and collect relevant data.
23. **Analyse the case-study data** using an appropriate international comparative framework.
24. **Identify common factors across cases** that are required for successful adoption.
25. **Write policy focused reports within each sub-task domain on key issues for successful adoption** of trusted automation.
26. **Conduct bi-annual Task meetings in different member countries,** in which findings from different national teams are presented and which support the development of wider research communities in these countries.
27. **Share Outputs** on IEA website, through publications and at conferences


## HOW TO PARTICIPATE

Participation requires commitment at both the country and institutional level. Countries must be members of the DSM TCP - paying a national subscription fee and committing to provide some in-kind support and management oversight of DSM TCP activities through sitting on the DSM TCP Executive Committee. Institutions must commit in-kind resources (largely staff time) to participate. Companies can participate by joining the DSM TCP and paying the same annual subscription fee as countries.

*Country participation.* This work will be established as a 'Task' under the IEA Demand Side Management Technology Collaboration Programme (DSM TCP). As such it is regulated by the DSM Policy and Procedures Guidelines and the Implementing Agreement (the legal basis on which the TCP is established by the International Energy Agency). For information on joining please contact the DSM TCP Chair, Prof. David Shipworth at UCL in the first instance. Country membership currently costs €10,000/annum, which enables countries to attend Executive Committee meetings and participate in all Tasks. While some Tasks charge an additional fee - there is no additional fee for participating in the Social License to Automate task.

*Institutional participation.* The majority of the work will be done by research institutions in DSM TCP member countries. To participate, institutions must be granted permission by their government representative on the DSM TCP Executive Committee. Collectively, within a country, institutions must





commit in-kind staff time to attend bi-annual workshops, provide access to case study projects and facilitate interviews , assist in preparation and review of country profiles and disseminate insights, reports and knowledge generated in the Task. There is no upper limit on participation. Person-time contributions can be made up from multiple researchers within one institution, or contributions from multiple institutions. Ideally, this person time would be closely aligned with existing nationally funded research activity to which the activities of the Task are closely aligned and can add value.

*Company participation.* Companies can participate by joining the DSM TCP as sponsors. Company membership currently costs €10,000/annum, which enables companies to attend Executive Committee meetings and participate in all Tasks. The company would then join the steering committee for the Task and could attend Task meetings and contribute expert input to the work of its sub-tasks.

# TASK WORK PLAN

The Task will be divided into a series of Sub-Tasks running over 2 years, with substantive work in each sub-task running sequentially.

The research will be case-study based, led in each participating country by the (or a panel) of country experts, supported by the Operating Agent.

The country experts and Operating Agent will meet every six months (prior to the TCP ExCo Meeting) where detailed analyses will be performed over a multi-day workshop. Between these meetings, participants collaborate on agreed research activities as described below.

The Task is proposed to be broken up in to the following sub-tasks.

Subtask 1: Common template for social and technical research approach

Subtask 2: Desktop and Case Study Data Collection and analyses

Subtask 3: Understanding Trust to Automate: social, economic, institutional and technical dimensions

Subtask 4: Country profiles and policy relevant body of knowledge

## Subtask 1: Common template for social and technical research approach

Timeline: April -August 2019

This sub-task will review relevant reports, regulations and other publications relating to failed and successful automation; secondary documents that may help anticipate how trust and technology acceptance could be gained and maintained.

The first sub-task will therefore develop a shared definition of the elements of social license in DSM automation. The elements of this definition may encompass:

- Which types of automation can be differentiated, e.g. in terms of automation levels and affected parts of the energy system?
- How is trust operationalized within the project? Which other technology acceptance factors are relevant besides trust (perceived value, sustainability, privacy, etc.)
- Who owns each element of the automation process? (what is the legal form etc.) Who profits? Who pays?
- Who and How are decisions made? (in the household/by the managers?)
- Who is responsible when things go wrong? How are dispute resolution systems understood and improved by participants?

The first subtask will build upon this definition to also:

- Define relevant case project parameters
- Develop interview guidelines for country experts
- Contact relevant institutional bodies, policy makers and regulators concerning their needs for



evidence

- Conduct a pilot case study analysis with a completed case study to validate categories

## **Subtask 2: Desktop and Case Study Data Collection and Analysis**

Timeline: June 2019-June 2020

Target projects and already published reports from the core member states will be selected to understand the key variables in each case study and shape up country profiles. Desktop analysis will be conducted to infer the social variables, practitioner variables institutional and structural components that would need to align for social License to be granted.

An appropriate international comparative framework building upon these variables will be constructed.

## **Subtask 3: Understanding trust to Automate: social, economic and technical factors**

Timeline: June 2019-June 2020

There are a range of issues that need to be considered when analyzing how the trust between users and network agents develop automation services across a metering boundary. This subtask captures the work of identifying common factors across cases that are required for successful adoption. This may involve probing

- Social and institutional dimensions – why was the project started and by whom? Organized how?
- Economic dimensions – how is the business case developed? What rules were relevant to setting price? Carbon constraints? Changes to tariff rules? What market structure at wholesale and retail level?
- Design practices: how can the user experience be optimized?

This subtask will also involve the development of policy-focused reports on key issues for successful adoption of automation related to each of these dimensions or across appropriate parameters such as size of installation, customer group, business coalition.

## **Subtask 4: Country profiles and policy relevant body of knowledge**

Timeline: January 2020 – April 2021

This outcomes of this body of work are two-fold. The first will be a suite of individual country profiles which outline the context-specific insights from each country. The profiles will document the distinctive factors that manifest in the case studies in order to distill lessons for future consumers and project proponents.

Second, will be a generic, guiding framework that works to identifying the key ingredients required to inform the development of a social license for DSM automation. This framework will identify key social, practitioner, and institutional variables that need to be aligned in order to promote the necessary conditions for promoting a social license to operate DSM automation.



## SAMPLE OUTPUTS AND KNOWLEDGE SHARING

- Country Profile database that outlines key case studies
- Guiding framework that identifies the critical variables necessary to promote a social license to operate DSM automation.
- Conduct bi-annual Task meetings in different member countries, in which findings from different national teams are presented and which support the development of wider research communities in these countries.
- Report to bi-annual IEA DSM TCP ExCo meetings on the work of the Task.
- Report to the IEA and providing input to IEA publications such as the Energy Efficiency Market Report and information portals such as the IEA [Efficiency Exchange Platform](#) to maximise impact



## Appendix A: Roles of Operating Agent and Country Experts

Examples of proposed case studies to participate in this IEA task.

### Australia

- CONSORT (Bruny Island)
- Monash University Microgrid
- Dex Mornington Peninsula

### Austria

- Flex+
- Green Energy Lab / Open Data Platform
- P2PQ
- Sim4Blocks
- ReFlex
- DECAS
- Smart Cities Demo Aspern
- HIT Field Trial
- PEEM
- C2G - Consumer2Grid

# HARD TO REACH ENERGY USERS

Sea Rotmann, SEA - Sustainable Energy Advice

## EXECUTIVE SUMMARY

Behavioural-oriented policy initiatives are rather limited, and often confined to experimental settings and utility-driven programmes. A recent, global review of policy efforts at the national and city level addressing low-carbon energy technologies showed a clear focus on technology market development (mostly subsidies) and market failures (particularly, information asymmetries). In fact, policy efforts addressing behavioural anomalies explicitly, are the exception. We believe that there may be a significant percentage of the human population that is currently not engaged or informed by our many efforts to elicit change in their energy-efficient technology uptake and energy consumption. This is even more so the case once you expand from hard-to-reach individuals and groups in the residential, to those in the commercial sectors, and across all fuels and energy services, including mobility. This, potentially very large energy user group is the focus of this new IEA DSM Task.

## Overarching Objectives and HTR definition

This Task will provide country participants with the opportunity to learn and share successful approaches how to identify and engage “hard to reach” (HTR) energy users. The Task will facilitate the development of robust social science-based guidance for designing programmes (e.g. national, municipal, utility-driven) that are more tailored to specific HTR audiences. It will also help identify effective approaches for improving existing programmes to increase uptake among specific HTR segments. To summarise, this Task serves four main objectives:

1. Identify and analyse who the HTR energy user segments are in the residential and commercial sectors encompassing all fuel types and energy services (including mobility), and provide guidance on how to best find and approach them.
2. Review behaviour change techniques and interventions (including the roles of legislation and regulation), to assess what has worked well (and not-so-well) in engaging HTR energy users across participating countries and varying contexts.
3. Leverage insights from participating countries’ programmes and case studies to develop practical guidance for how to reach the HTR customers in energy efficiency and DSM interventions, run better engagement trials, and monitor / evaluate outcomes.
4. Provide policy and programme recommendations for the design, implementation and evaluation of energy efficiency and DSM behavioural-oriented measures on HTR in participating countries.

*“In this Task, a hard-to-reach energy user is an energy user from the residential and commercial sectors who uses any type of energy or fuel and energy services, including mobility, and who is typically either hard-to-reach physically, underserved, or hard to engage or motivate, for a variety of reasons. These could include lack of access to information, lack of government or industry policies and programmes targeting such user groups, lack of financial means, lack of confidence, vulnerability, or being a new type of user (e.g. new technology owner) who has not yet been identified or engaged by the relevant agency.”*

## Motivation, Research Questions and Null Hypothesis

The motivation for this new work comes from five directions:

1) **To build on IEA DSM Task 24 behaviour change expertise and global expert network** as well as using the many tools that were developed and have successfully informed policy in our participating countries. These are described in the [Task 24 Toolbox for Behaviour Changers](#) (Rotmann, 2018a).

**Research Question:** *How can the toolbox for Behaviour Changers developed by Task 24 be used to support better interventions targeted at the hard-to-reach energy users?*

2) **To explore the many differing definitions of what constitutes a “Hard-to-Reach”** (and thus motivate and engage) energy user or customer, in the residential and commercial sectors and to assess different approaches and barriers when targeting these users (including potential gender bias and/or socio-economic inequalities).

**Research Questions:** *Who are HTR energy users in each participating country? How can they be defined and described? How materially are these HTR markets underserved?*

3) **To test the hypothesis that this underserved user group may entail a large number** of energy users (particularly when we define “hard-to-reach” also as “underserved”, “hard-to-motivate or engage”, see below) which also means there is a large potential for energy efficiency and conservation improvements.

**Research Questions:** *Based on country statistics and expert opinions, what is the approximate, estimated size of the HTR user group in each participating country? How many vulnerable HTR users are situational and transitory and can we better quantify these groups by better categorising them? Based on implemented pilots and case studies in each participating country, what is the potential effectiveness (or effect size) that one can expect from behavioural-oriented policy intervention on this group?*

4) **In addition, this Task will aim at collecting insights into best practice and shared learnings** about what type of interventions have the greatest potential to motivate and engage the HTR, and which were less successful (and why).

**Research Questions:** *What type of policy interventions (e.g. non-pricing mechanisms addressing contextual factors) and behaviour change programmes have the potential to motivate and engage HTR users to use energy most effectively and efficiently? What is the level of public acceptability of such policy interventions in each participating country? What are the ethical challenges associated to them?*

5) **To explore opportunities for non-state sector co-funding to develop and test field research pilots** for HTR energy users based on international best practice. We will show how behaviour change interventions on this target group work in practice. These interventions will provide positive financial, energy efficiency and social (including health) outcomes for this user group - as well as macro-economic benefits for their countries, whilst contributing to significant climate change targets, globally.

**Research Question:** *Can we use field research pilots to prove that a robust, internationally-validated, standardised process for behavioural interventions on the HTR, is a better approach than the current scattergun one?*

**Our null hypothesis**, which we hope to test with the help of experts from our participating countries, other expert contributions and the IEA Secretariat (see Subtask 2a) is as follows:

*A significant proportion (>30%) of the population in the residential and commercial sectors currently falls under the category of “hard-to-reach” energy users as defined by this Task.*

## Outputs and Outcomes

By cost- and task-sharing and a lot of expert contributions from in-kind support we are leveraging at least 90 person months of expert time for this 3-year Task. This is based on three participating countries. With every additional country that joins, we will gain at least 6 additional months of National Expert time.



The table below outlines the main deliverables from this work.

Subtask	Deliverable	Deliverable Name	Deliverable Type
0	D0	Work plan defined and signed off	Report
0	D1	Co-supervision of PhD students	PhDs
1	D2	Expert network and dissemination	Various
1	D3	At least 3 international expert workshops	Workshops
1	D4	2 peer-reviewed scientific papers	Scientific articles
2	D5	HTR Definition	Slide deck
2	D6	Country definitions and case study analyses	Reports
2	D7	Literature Review	Report / Article
2a	D8	International publication on HTR	Book
3	D9	Standardised research process	Toolbox / Article
4	D10	Field research pilots	Reports, Policy Briefs

**The main impact** expected from this Task is to *develop a greater understanding who the HTR energy user group is and how to better engage these users with well-designed and targeted interventions.*

**General outcomes** from collaborating on this international research Task are:

- Global networking and collaboration to share learnings and stop duplicating efforts;
- Access to cutting-edge expertise, tools and resources which will aid cross-country comparisons;
- Co-creation and promotion of new solutions to old problems, turning participating countries into leaders on how to engage this important and underserved energy user group;
- Insights for industry into serving their “Hard-to-Reach” customers by leveraging learnings from a wide range of different countries’, sectors’ and research disciplines’ expertise and case studies;
- Three PhDs associated with this Task researching in depth various aspects of the HTR;
- Stakeholder and end user research that enables a better understanding of the contextual factors affecting HTR energy users in different countries and sectors, allowing us to better target them;
- Guidance on how to better apply behaviour change interventions on this HTR user group in the residential and commercial energy sectors; including how to align different “Behaviour Changers” to design and run field pilots and evaluate interventions to prove real, long-term change;
- Analysis into how large this energy user segment could be in different sectors, fuels and countries - this should drive changes to government policies (including regulation and legislation) and industry / community sector programmes paying more attention to this underserved user group;
- More capacity to apply behaviour change insights to policy making and real life interventions in IEA DSM countries, including through collaboration with the G20, IPEEC and Energy Efficiency in Emerging Economies (E4) programme, as well as major energy efficiency and behaviour change collaborations such as ACEEE, eceee, BECC, BEHAVE and selected H2020 programmes;
- High quality and accessible dissemination of HTR case studies and field research - becoming the depository of global knowledge on hard-to-reach energy users.

# RATIONALE (WHY)

## Background

It is generally agreed that large-scale energy efficiency and behaviour change efforts kicked off in response to the early 70s oil shocks (e.g. Whitford, 2015). It even has been argued that they almost single-handedly created “a selective and conservationist approach, which was practically absent heretofore in our consumer society” (Perez-Guerrero 1975, 44), and served as “turning points” that defined the following quarter-century of Western energy policy (Venn 2002). These efforts have been ongoing, more or less, in most OECD countries. However, the behavioural potential for reducing energy waste and consumption remains vast (at least 20%, probably more like 30%, see Dietz et al, 2009) and the relatively slow uptake of energy efficiency relative to its value is still regarded as a market failure (e.g. Gillingham & Palmer, 2014). These authors showed that the way individuals make decisions about energy efficiency leads to a slower diffusion of energy-efficient products than would be expected if consumers made all positive net present value investments. There are several behavioural anomalies (e.g. limited attention, loss aversion, status quo bias) that help explain this, though a key issue is the extent that some of them have become systematic, leading to “behavioural failures”. Karlin, Zinger, and Ford (2015) outline four such characteristics of energy use that present challenges in this regard - namely that energy use is *abstract, nonsensory, consists of multiple behaviours*, and is of *low personal relevance*.

Many of our behaviour change efforts focus on uptake of energy-efficient technologies in developed countries and so-called “green consumption” (Lorenzen, 2014). Much of our focus is on technology choice *per se*, with a lot less on the cognitive, motivational and contextual factors that are affecting those choices (e.g. Mourik and Rotmann, 2013). Jackson (2011) examines the complex relationship between income and human well-being. He argues that the rich world has a responsibility to “make room for growth” (similar to the “Contraction and Convergence concept” central to the Rio 1992 Sustainability Charter) where it matters most in terms of improved well-being: in the poorest nations (and, we would like to add: the most vulnerable and underserved members of the community in any nation). He argues that this cannot be achieved simply through efficiency improvements or material “decoupling”.

Relatively speaking, behavioural-oriented policy initiatives are rather limited, and often confined to experimental settings, and utility-driven programmes (e.g. OECD, 2017; Andor & Fels, 2018; Rotmann and Ashby, 2019). Mundaca et al (2018) undertook a global review of policy efforts (at the national and city level) addressing low-carbon energy technologies. Results show a clear orientation towards technology market development (mostly subsidies) and market failures (particularly, information asymmetries). In fact, policy efforts addressing behavioural anomalies explicitly, are the exception. We believe that there may be a significant percentage of the human population that is currently not engaged or informed by our many efforts to elicit change in their energy-efficient technology uptake and energy consumption. This is even more so the case once you expand from hard-to-reach individuals and communities in the residential, to those in the commercial sectors and looking at different types of fuel and energy services, including mobility. **This, potentially very large energy user group is the focus of this new IEA DSM Task.**

## Overarching Objectives

This Task will provide country participants with the opportunity to learn and share successful approaches how to identify and engage “hard to reach” energy users. This can include a wide range of behavioural interventions such as providing energy audits and advice, energy savings tips, energy-efficient technology or Apps to control and reduce energy consumption, energy savings kits etc. The Task will facilitate the development of robust social science-based guidance for designing programmes (e.g. national, municipal, utility-driven) that are more tailored to specific HTR audiences. It will also help identify effective approaches for improving existing programmes to increase uptake among specific HTR segments. To summarise, this Task serves four main objectives:

1. Identify and analyse who the HTR energy user segments are in the residential and commercial (including industrial and service) sectors; including how to best find and approach them.
2. Review past and potential behavioural techniques and interventions, assessing what has worked well (and not-so-well) to engage HTR customers across participating countries and varying sectors, fuel types, services and contexts.
3. Leverage insights from participating countries' programmes and case studies to develop practical guidance for how to reach the HTR customers in energy efficiency and DSM interventions, run better engagement trials, and monitor / evaluate outcomes.
4. Provide policy and programme recommendations for the design, implementation and evaluation of energy efficiency and behavioural-oriented interventions for the HTR in participating countries.

## Motivation and Research Questions

The motivation for this new work comes from five directions:

1) **To build on IEA DSM Task 24 behaviour change expertise and global expert network** as well as using the many tools that were developed and have successfully informed policy in our participating countries. These are described in the [Task 24 Toolbox for Behaviour Changers](#) (Rotmann, 2018a).

**Research Question:** *How can the toolbox for Behaviour Changers developed by Task 24 be used to support better interventions targeted at the hard-to-reach energy users?*

2) **To explore the many differing definitions of what constitutes a “Hard-to-Reach”** (and thus motivate and engage) energy user or customer, in the residential and commercial sectors and to assess different approaches and barriers when targeting these users (including potential gender bias and/or socio-economic inequalities). This would include an assessment of the different HTR groups and segments that the participating countries are trying to reach, an identification of which of these HTR segments are common across multiple countries, and which are less so.

**Research Questions:** *Who are HtR energy users in each participating country? How can they be defined and described? How materially are these HTR markets underserved?*

3) **To test the hypothesis that this underserved user group may entail a large number** of energy users (particularly when we define “hard-to-reach” also as “underserved”, “hard-to-motivate or engage”, see below) which also means there is a large potential for energy-efficiency and conservation improvements.

**Research Questions:** *Based on country statistics and expert opinions, what is the approximate, estimated size of the HTR user group in each participating country? How many vulnerable HTR users are situational and transitory and can we better quantify these groups by better categorising them? Based on implemented pilots and case studies in each participating country, what is the potential effectiveness (or effect size) that one can expect from behavioural-oriented policy intervention on this group?*

4) In addition, this **Task will aim at collecting insights into best practice and shared learnings** about what type of interventions have the greatest potential to motivate and engage the HTR, and which were less successful (and why).

**Research Questions:** *What type of policy interventions (e.g. non-pricing mechanisms addressing contextual factors) and behaviour change programmes have the potential to motivate and engage HTR users to use energy more effectively and efficiently? What is the level of public acceptability of such policy interventions in each participating country? What are the ethical challenges associated to them?*

5) **To explore opportunities for non-state sector co-funding to develop and test field research pilots** for HTR energy users based on international best practice and the Task 24 toolbox for Behaviour

Changers. We need to show that behaviour change on this hardest-to-reach target group actually works in practice - thus opening up a very large potential new energy user group that can be targeted for tailored behaviour change interventions. These, in turn, will provide positive financial, energy efficiency and social (including health) outcomes for this user group - as well as macro-economic benefits for their countries, whilst contributing to significant climate change targets, globally.

**Research Question:** *Can we use field research pilots to prove that a robust, internationally-validated, standardised process for behavioural interventions on the HTR, is a better approach than the current scattergun one?*

## 1. Building on, and utilising tools from Task 24 on Behaviour Change in DSM

This work was inspired by, and is a natural extension of the highly-successful Task 24 which ran from January 2012 to December 2018. This first global research collaboration on behaviour change in DSM aimed at facilitating and sharing knowledge between multiple stakeholder sectors and developing recommendations about the influence of behaviour change in the effective implementation of energy-efficiency policies and programmes. After a period of building the theoretical framework and collecting and analysing case studies ([Phase I](#)), Task 24 has now finished the second phase ([Phase II](#)), which focused on engaging actual “Behaviour Changers” from five major sectors in co-designing real life interventions. This work, which is described in almost 100 publications, included:

- Undertaking almost 60 country workshops with 100s of Behaviour Changers in 17 countries;
- Mutually-agreeing on a main topic of interest for each of the participating countries;
- Undertaking landscape and stakeholder analyses in these countries;
- Supporting them with evidence-based scientific approaches and practical case study comparisons from other countries along the way; and
- Designing behavioural interventions that were then implemented and evaluated in real life pilots.

The Task also created a global expert network of 400+ Behaviour Changers from over 20 countries. The relationships and tools developed in Task 24 are invaluable and will be built on further with this work.

## 2. Differing definitions of HTR in the residential and commercial sectors

The focus on, and definitions of energy users that are hard-to-reach will very likely differ between countries, but also between sectors within countries. There is clearly a wealth of research to be undertaken in this area, which will be of global interest in light of the necessary societal and system transformations to avoid climate catastrophe and ecosystem collapse (Jackson, 2011). We will work together with our participating country experts to create an overarching, broad definition like our [IEA DSM Task 24](#) definitions on energy behaviour and behaviour change (Rotmann and Mourik, 2013). For now, we propose this draft definition of hard-to-reach energy users for this Task:

*“In this Task, a hard-to-reach energy user is an energy user from the residential and commercial sectors who uses any type of energy or fuel and energy services, including mobility, and who is typically either hard-to-reach physically, underserved, or hard to engage or motivate, for a variety of reasons. These could include lack of access to information, lack of government or industry policies and programmes targeting such user groups, lack of financial means, lack of confidence, vulnerability, or being a new type of user (e.g. new technology owner) who has not yet been identified or engaged by the relevant agency.”*

Through this HTR Task, this initial draft definition will be refined, and several subsets within each sector will be identified to specifically address through this work. Although this Task will begin with a broad definition that captures the breadth of what is included under the “Hard to Reach” umbrella, definitions of smaller subsets will also help identify which HTR audiences may be the most promising to address through this international collaboration (see Research Questions, above).

Previous Task 24 work on this topic, in collaboration with the U.S. Consortium for Energy Efficiency (CEE), has shown just how divergent the definitions of HTR customers can be (see Rotmann and Ashby, 2019). US and Canadian utilities interviewed during the last year of Task 24 Phase II defined “hard-to-reach” customers as:

- Low income or from lower socio-economic groups
- In energy hardship or fuel poverty (“vulnerable customers”)

- Rural, isolated or physically hard-to-reach communities
- Hard to motivate or engage customers
- Underserved customers
- Tenants in multi-family apartment buildings (where the landlord paid the utility bills)
- Not connected to internet or smartphone
- Disadvantaged communities, e.g. indigenous or immigrant communities
- Small to medium businesses.

### Residential sector

Work in the UK (see Ambrose, to be published) also includes Citizens Panels with the hardest-to-reach (and most vulnerable), including people who are: Recently out of homelessness; recently released from prison; users of food banks; suffer poor mental and physical health etc.

OR, the hardest-to-reach can be grouped as:

- *The chaotic*, because of drink and drug problems;
- *The scared*, because they do not want to bother their landlord;
- *The hidden*, because they are in such poverty, they only just exist, so any change could make matters worse. Thus, it is better to avoid all change. They have consistently been treated badly by the utilities, so they do have personal experience to enforce their distrust;
- *The ill*, those with mental ill health or disabilities;
- *The stoic*, 'I'm not complaining' group;
- *The proud*, "I know everything in this field and I am doing everything it takes". They may know a lot but not everything, and they are not connected to the decision makers and so they tend to complain about the government's lack of progress; and
- *The skeptic*, who don't believe they can do any improvements, perhaps because they don't have the money / time to invest or it is not their priority or they think it is too difficult to engage their partners / community / coworkers.

Brenda Boardman (e.g. Boardman, 1991), who has studied fuel poverty for 5 decades says: "*They will never self-identify, or self-refer. You might get some through health links, but even then they would probably refuse assistance. A pepper-potting, individual targeting approach will never reach them all. The ONLY way to get them involved is when they want to be helped and I think this might happen best through their neighbours and community.*"

### Examples

In the Spanish residential sector, one of the main barriers or difficulties to engage users (especially when it relates to energy management or improvement of the common spaces and building) is the fact that most of the multi-family apartment buildings are owned by several households (individuals, but also banks and real estate companies). About 60% of the dwellings are in multifamily apartments according to Spanish Statistical Office data from 2011. Many of them rent and don't pay the utility bills (also called the "Split Incentive barrier" (e.g. Melvin, 2018). This situation makes it very difficult for them to reach agreements on the management of the common spaces and there are no leading actors promoting energy renovations of the buildings and common installations. Our Spanish PhD student will focus on the energy cultures of these, and other HTR groups.

In New Zealand, energy poverty and socio-economic inequality have been shown to be a major issue when it comes to the hard-to-reach in the residential sector (O'Sullivan et al 2011). Particularly Māori and Pacific Island communities are disproportionately hit by the negative health effects of energy inefficiency and poor housing (e.g. Howden-Chapman and Tobias, 2000; O'Sullivan et al, 2013). These groups have also been shown to be more difficult to reach with government insulation subsidy programmes than other populations (e.g. Barnard et al, 2011 p24). Our NZ fuel poverty National Expert also found a significant risk factor for young people living in cold housing and fuel poverty (O'Sullivan et al, 2017).

According to our Chief Advisor Aimee Ambrose (forthcoming), UK initiatives and services intended to support individuals and households with energy-related problems (i.e. high bills, cold homes, poor energy

efficiency etc.) consistently fail to reach the most marginalised, vulnerable and low income households. Resources are instead taken up by consumers better positioned to take advantage of the help on offer. There is very little existing knowledge or good practice in relation to engaging the hardest-to-reach in energy-related initiatives with the potential to improve their health, wellbeing and prosperity. This knowledge is vital as energy prices continue to rise and such households face higher energy costs as a proportion of their income (Bouzarovski and Herrera, 2016) than other groups in society in addition to increasing pressures allied to welfare reform and limited access to social housing.

A recent report from the UK Committee on Fuel Poverty (2018) said of government progress towards eradication of the problem that: "*Overall progress is stalling, with a mixed performance across each of the three main measures. Since introducing the strategy in 2014/15 the total number of households in fuel poverty is up by 210,000 to 2.55 million. Ministry of Business, Energy and Industrial Strategy (BEIS) forecast progress on upgrading the energy efficiency levels of fuel poor homes is 2% to 6% lower than previously forecast. We estimate that the funding needed to complete the strategy has therefore grown from £15.4 billion in our 2017 Annual Report to £17.1 billion.*" In spite of this failure to impact significantly on fuel poverty, the UK government's flagship energy efficiency scheme only reserves 30% of the funding available for the treatment of fuel poor households but have pledged to reverse this in future rounds.

Research by Project Partners Sheffield Hallam University and Citizens Advice (see Ambrose et al, to be published) with a panel of highly marginalised and vulnerable energy users in England revealed that participants face multiple and complex barriers to engaging with the energy advice services on offer, that are both structural and personal in nature. For example, anxiety associated with the need to telephone energy companies or other energy advice providers was widely reported and where face-to-face support is not readily accessible, nearly all participants preferred to tolerate the problems they were experiencing rather than engage through other mediums such as on the phone or online. This was the case even in the face of considerable problems such as being owed hundreds of pounds by an energy supplier; having a young child with cold-related illness and in the case of one participant, having a prepayment meter installed in their home without their knowledge.

In the case of Norway and Sweden, research indicates that the elderly may constitute as being hard to reach due to a number of reasons. Even though many who are in the later stages of life in Norway have a sound financial standing and often enjoy this freedom by investing in energy efficiency measures, factors like the onset of illness have been observed to possibly cause severe rebound effects (Thronsdén and Berker 2012). This report also uncovered that different energy consumption ethics may manifest in households of the elderly, where memories of a more resource-strict past had caused values of consumption sobriety and conservation, even in the face of too-low temperatures. A study by Thronsdén and Ryghaug (2017), which explored the potential for smart metering technology to affect consumption behaviour in end users, found that certain issues resonate with the elderly more strongly than others. This could possibly constitute challenges to implementing new energy technology in a meaningful way. Specifically, respondents in focus groups were concerned about the knowledge gap, and its potential for rendering older individuals lacking technological experience unable to adapt to price signals. Another concern that was voiced was that (relatively small) incentives toward consumption reduction or time shifting would not make sense after living a long life in the face of well-established habits and routines. Sweden, which has been found to have the lowest rate of energy poverty in the world (see Thomson et al, 2017), has also identified the elderly living on their own in too-large and inefficient houses as a potential HTR user group.

Researchers in Portugal used novel methodologies to map the potential for fuel poverty of residential dwellings (Simoes et al, 2016). On average, 22% of the inhabitants were found to be potentially fuel poor regarding their dwellings' space heating and 29% regarding space cooling. There was a large variation across the country. Another study (Gouveia et al, 2018) tried to identify heating and cooling thermal performance gaps in energy poor and "obese" households. The existence of these gaps allowed confirming and/or discarding the initial hypothesis of the poverty or obesity conditions. Results disclose socio-economic variables, as income, and consumers' behaviour as key determinants of electricity consumption. A major conclusion of this study was that electricity consumption cannot be used alone to segment consumer groups.

There is likely also a HTR segment in the mobility domain (which is of interest to the [G20 Transport Task Group](#)) that overlaps with the energy sector, such as:

- (Rural or remote) passenger vehicle owners with no access to public transport, including ones who may benefit from switching to electric vehicles (EVs);
- Individual heavy vehicle drivers;
- Heavy vehicle fleet managers;
- Individual light and medium goods vehicle drivers etc.

In New Zealand, for example, EVs are usually thought of as only suitable for urban areas. However, the higher travel distances done by rural and peri-urban households with poor public transport access make the total cost of ownership of EVs more compelling (particularly as second-hand EVs start to become available). In addition, many rural areas have seen the closure of local fuelling stations and now have to drive out of their way to refuel. EVs can be charged at home making charging vehicles in rural areas more convenient than refuelling.

#### *Commercial sector*

Pacific Gas & Electric (PG&E, 2001) also did work on this subject in the commercial sector in California and described the hardest-to-reach customers as such:

- 1) Small business customers that have fewer than 10 employees;
- 2) Businesses in leased space;
- 3) Rural business customers;
- 4) Strip malls;
- 5) Local chain or single-location restaurants;
- 6) "Mom and pop" restaurants and stores; and
- 7) Convenience stores.

#### *Examples*

In California, the PG&E 2001 report found that the majority of HTR segments as identified by the Californian Public Utility Commission (CPUC) have historically been under-served by utility-funded programmes. In particular, this included small customers that have less than 10 Employees, businesses in leased space, strip malls, local chain or single-location restaurants, and convenience stores. Of these, the two most significant segments are renters and businesses with less than 10 employees, which combined comprise over 60 percent of the small / medium non-residential population in terms of annual energy consumption. Furthermore, these two segments overlap significantly with strip malls, convenience stores and local chain / single-location restaurants.

In the commercial sector in Spain, it was found that the hardest to reach are the contractors that are in charge of the building (Ruiz, 2010). For example, janitors and cleaning service employees are usually contracted externally in Spain. Sometimes, the people who manage a great part of the energy consumption, are hidden to the building owners, staff and other users of the building. Few, if any efforts, have been undertaken to engage this important HTR group.

Our Task 24 case study in the largest health network in North America (see Cowan et al, 2017 and 2018) also focused on building operators and facility managers as a hard-to-reach user group. They felt both *invisible* in terms of the importance that their work had on the survival of patients and effective (but not necessarily efficient) running of the hospitals, and *over-blamed* when it came to the perception of any impacts of building performance on patient comfort or health. This multi-award winning pilot showed that well-designed behaviour change interventions that aim to have a collective impact, can lead to significant impacts (up to 18% in energy savings in one pilot building) and changes in both individual behaviours and corporate culture. Nursing staff were also highlighted during this pilot, as a hard-to-reach user group with a lot of potential for impact on energy use in the health sector.

Lopes et al (to be published) are studying organisational and behavioural demand response in SMEs in Portugal (see also Catarino et al 2015). In Portuguese companies, the major behavioural barriers appear to be limited time, information, and cognitive capacity to process complicated and unfamiliar choices

(Catarino et al, 2015; Henriques & Catarino, 2016). It is important to know what kind of information and feedback is most effective at influencing businesses' energy decisions. Changing individual energy behaviours requires not simply new technologies, price incentives or information campaigns, but strategies that address both internal and external influences on behaviour and corporate culture change. In the Portuguese public sector, Figueres et al (2018) found a low adoption level of integrated sustainability policies and practices, despite the expected positive trends related with the mandatory social and economic practices.

In New Zealand, we have analysed a case study on heavy vehicle fleet driver behaviour training by New Zealand Post (Mourik and Rotmann, 2013). During training development, it became clear very quickly that the individual drivers who were contractors and not directly employed by NZ Post were very hard to reach - in terms of training engagement - by the NZ Post sustainability manager. However, when they instead chose some of the most respected drivers to become the others' trainers and mentors, the training uptake and responding reduction in fuel emissions from more efficient driving behaviours, rose significantly. This is a good example of the importance of understanding your "ABCDE building blocks of behaviour change" (see below):

- A. Your **Audience** - the independent driver contractors and their contexts and needs;
- B. Their **Behaviours** - varying inefficient driving behaviours (up to 40% difference in fuel efficiency when tested!), yet almost all thought they were above-average drivers when initially surveyed;
- C. The **Content** of the messaging - how to drive more fuel efficiently and safely, delivered as a training programme; see also
- D. The **Delivery** mechanism of the message - initially, delivered by NZ Post but when that was shown to be largely unsuccessful it was changed to instead being delivered by the most respected drivers as trainers and mentors; and
- E. The ex-post **Evaluation** of the programme, which in this case showed an average of 15% reductions in fuel use from more efficient driving behaviours.

### 3. Testing our Hypothesis

Not much, if any, work has been undertaken in estimating the proportion of the hard-to-reach as part of the general population. There have been country-level efforts to determine the percentage of the population in fuel poverty (e.g. Committee on Fuel Poverty CFP, 2018; Howden-Chapman et al, 2011) and international efforts to analyse access to energy (e.g. IEA, 2017), but we are not aware of a global, cross-national study that tried to ascertain the extent of this underserved user group - especially not in both major energy-using sectors (residential and commercial). We hope to undertake primary research, using existing country-level statistics and stakeholder surveys, to ascertain the approximate size of the HTR energy user group in each of these sectors.


Our null hypothesis, which we hope to test with the help of experts from our participating countries, other expert contributions and the IEA Secretariat (see Subtask 2a) is as follows:

*A significant proportion (>30%) of the population in the residential and commercial sectors currently falls under the category of "hard-to-reach" energy users as defined by this Task (see above).*

### 4. Field research pilots to test better approaches to reach the HTR

As Phase II of Task 24 has shown, the best way to prove that a behavioural intervention has worked is to test it in the field (e.g. Cowan et al, 2017). In order to do so in a way that can yield cross-country comparisons, we propose to use the tools and recommendations highlighted in the *Toolbox for Behaviour Changers* and by our Project Partners See Change Institute, to co-create a standard, internationally-validated process to **align, define, design & deploy** (which includes **evaluation** of the pilots) such interventions. The only way this process can be validated and standardised is to test it in the field. Once it has been tested, including by cross-country comparisons, outcomes from the pilots can be utilised to support policy message framing and development of further pilots and programmes for the





HTR. We hope to attract several co-funders, including non-state actor sponsors and experts willing to share resources and data to undertake several such field pilots in our participating countries. This can take the form of currently-existing field pilots and programmes being adapted to this process.

Our experience in Phase II of Task 24 has taught us that field research piloting can be quite difficult and expensive but is also very rewarding and well-worth its initial investment (see Cowan et al, 2018 for example). Not all of our participating countries may be able to fund field research pilots on the chosen topics of focus (decided on in the DEFINE Phase, see below) from scratch. However, we will still be able to apply our process *ex-durante* and even *ex-post* to relevant pilots that are either currently underway or have recently been completed. We have learned from Task 24 that it is best to be flexible when it comes to how field research pilots will be chosen, supported and / or co-funded, as a lot of possibilities will open up once Subtasks 1 and 2 are underway. Not every country will have to co-fund and undertake a full field research pilot as part of this Task. The decision to do so will depend on the interest, engagement, and non-state actor networks that we can establish, as well as any (changes in) policy directions etc. that may help drive it.

## METHODS & PROCESS (HOW)

### Multi-stakeholder and trans-disciplinary collaboration

Sovacool (2014) said, in a review of 15 years of energy social science research: *“Coupled with the need for more interdisciplinary breadth is the promise of comparative case study research. Comparative studies, by producing more data than a single case, can more rigorously generate and test hypotheses across multiple areas, resulting in stronger evidence through a convergence of findings, and a wider applicability of results. Moreover, when researchers from different backgrounds are incentivised to conduct collaborative and cross-national projects, they can capitalise on their strengths and offset potential weaknesses.”*

Hantrais (1995) noted: *“Comparisons can lead to fresh, exciting insights and a deeper understanding of issues that are of central concern in different countries. They can lead to the identification of gaps in knowledge and may point to possible directions that could be followed and about which the researcher may not previously have been aware. They may also help to sharpen the focus of analysis of the subject under study by suggesting new perspectives.”*

The International Energy Agency’s (IEA) Technology Collaboration Programmes (TCPs) highlight, in their name, the importance of research and technology collaborations. Over 6000 scientists partake in the 38 TCPs. We believe that IEA DSM Task 24 has created one of the most extensive and engaged expert collaborations, extending its reach to all sciences studying “behaviour” (grouped into the 3 main disciplines of psychology, economics and sociology but encompassing many sub-disciplines) and other “Behaviour Changers” from government, industry, the community and service sectors (see Rotmann and Mourik, 2013; Rotmann, 2016). The entire premise of the Task 24 “Behaviour Changer Framework” (Rotmann, 2016) is based on facilitating multi-stakeholder collaboration, following a *Collective Impact Approach* (Kania and Kramer, 2011). We will utilise and build on these networks and collaboration tools in this Task. We will specifically aim to co-develop and -test an internationally-validated, standardised research process to enable data collection and analysis, as well as intervention design and implementation, in this Task (see Subtask 3).

### Task aims and research process

The primary aim of the Task is to enable participating countries to improve policy, industry, research and community outcomes focusing on hard-to-reach energy users, by applying insights and lessons learned from collaboration with other countries and global experts.

The detailed objectives and deliverables (see below) were decided collaboratively during four multi-country and national expert meetings over 4 months, from November 2018 to March 2019. Over 60 experts from 17 countries and 2 international organisations (IPEEC and G20) were contacted and given opportunity to provide input into this work plan.

Some past research efforts have sought to compare strategies for engaging customers in energy efficiency / demand response, yet nearly all energy programmes in the “real world” are comprised of multiple strategies (SCI, unpublished). For example, Home Energy Reports (HERs) combine general information, feedback, and social comparison strategies to change behaviour and can be delivered via email, print mail, or both. Although considerable attention has been given to identifying and categorising strategies, there is no clear consensus on the best way to do this and even less on how to successfully combine them in a field setting.

While this approach to energy programmes has led to some gains in our understanding of strategies to influence energy use, impacts have been inconsistent and it’s not always clear which part of a programme is actually leading to savings. Estimates of savings from individual behavioural programmes range from 0%-23%, with most programmes in the residential sector saving between 0-6.5% (Sussman et al, 2016; Doherty et al, 2015). Savings vary significantly within and across strategies and within and

across populations. As such, policy makers have little guidance on how to select strategies to be used in any given programme.

Recent research has advocated for more consideration of how these strategies can be implemented more effectively (e.g. Clayton et al, 2016). One review (Šćepanović et al, 2017) discussed this issue and suggested separating strategies and context. Our Task 24 Project Partner, See Change Institute (SCI), believe that this approach is vital to improving our understanding and suggest that a social scientific approach to energy programmes requires moving from discussing behaviour-based programmes in terms of “strategies” to one of identifying and testing programmatic “variables”.

In collaboration with Task 24, SCI undertook a comprehensive methodology review of behavioural programme evaluations (Karlín et al, 2015a) and developed and psychometrically-tested a standard evaluation tool, called “beyond kWh” (Karlín et al, 2015b and Southern California Edison (SCE), 2015). We then tested this toolkit in the field on our Irish Energy Saving Kit pilot (Rotmann and Chapman, 2018). SCI has also developed a framework to identify and test programme variables as the “building blocks of behaviour change” and a process for policy makers to design, implement, and evaluate such programmes. This process, which we will utilise for case study analyses and recommend for any pilots to be developed as part of the Task, contains the following elements:

## A Process for Behaviour Change



Diagram of the See Change Institute Process



1. *ALIGN stakeholders and explore landscape*

We will conduct a **stakeholder assessment** which will bring together experts from the government, industry, research and community sectors to identify individual and collective goals and mandates. The Task 24 Expert Platform will be built on and broadened to include global HTR experts from different sectors and research disciplines. We will use the *Behaviour Changer Framework* to visualise the current socio-ecosystem and end user contexts and decide on main HTR target groups in each sector. We will also undertake a **landscape analysis** on current literature, policies and programmes on how to reach the hard-to-reach in the residential and commercial sectors. This will include stakeholder interviews how they ran engagement trials and monitored and evaluated outcomes (using the ABCDE framework: coding for Audience, Behaviour, Content, Delivery and Evaluation, see below). This report will help us to better understand similarities and differences across national boundaries.



2. *DEFINE target Audience & Behaviour*

Based upon the stakeholder and landscape analyses undertaken in the ALIGN Phase, we will define each of the the HTR target groups (aka **audience**) and identify the target **behaviours** for each group that show the most promise for energy savings. To do this, we will undertake mixed-methods research on each group to assess their “energy culture” (adapted from Stephenson, 2010), which is comprised of what they have (infrastructure), think (attitudes), know (awareness), and do (behaviour). This serves three purposes: (1) creating an audience profile for each group, (2) identifying target behaviours, and (3) identifying barriers, motivations, and key leverage points to select strategies and design interventions.



3. *DESIGN and test Content & Delivery Strategies*

Building from the ALIGN and DEFINE research, this step is comprised of identifying and pre-testing (when possible) appropriate strategies for each audience / behaviour. **Content** and **Delivery** strategies will be identified based on the research and we will develop our programme concepts that can be used by countries for pilots. We will also explore in-kind and co-funding opportunities to design field research trials based on these concepts. We will focus on a different HTR audience group in each of the sectors so different country contexts can be explored, contrasted and compared.

4. *DEPLOY and Evaluate field pilots*

In this phase, we will collaborate with in-country partners to **deploy** a field pilot of a new or improved HTR programme (where co-funding can be found). We will **evaluate** each pilot to not only measure savings, but also to understand how and for whom the programme did (or did not) work and identify best practices for scaling and /or replicating it. This will include using and testing the “beyond kWh tool” and will follow robust social science and programme evaluation methods.



The final step of the Task is will focus on capacity building and dissemination.



5. *SHARE externally and build capacity*

In this last phase, we will work with the IEA Secretariat and the G20 Working Groups on Energy Efficiency (amongst others) to **share** findings and help build capacity in key emerging economies through the Energy Efficiency in Emerging Economies (E4) programme. We will disseminate our work via conferences, journal

articles, DSM University webinars, and IEA publications that include as many DSM, G20 and emerging economies as possible.

For the case study analyses in Subtask 2 we will describe each programme in terms of SCI's "Building Blocks of Behaviour Change" (Karlin et al, 2016), as follows:

- A. **Identify key AUDIENCE segments that are hard to reach in each country, in two main sectors (residential and commercial).** Audience characteristics include both *demographic* (e.g., age, income, gender, homeownership) and *psychographic* (e.g., values, self-efficacy, identity, locus of control) variables. Understanding and leveraging these variables allows for customisation and personalisation of approaches, both at the programme level, and potentially at the individual level when combined with audience segmentation and machine learning.
- B. **For each audience segment, identify what specific BEHAVIOURS have been targeted in past research.** Providing specific target behaviours can focus programme design, enabling the programme to match strategies and behavioural components to more closely reflect objectives. However, the sheer number of possible energy-saving behaviours makes this approach difficult to implement in practice. The *unique features of various characteristics* of energy behaviours (e.g. the upfront cost, time, effort and skill required) influence individual understanding and engagement with those behaviours. We will further delve into understanding these features.
- C. **Highlight what messaging CONTENT and strategies were employed.** Content refers to the *behavioural science strategy and message framing* used in the intervention. Past behavioural research has almost exclusively focused on this building block. While many different programmes utilise similar behaviour change strategies (e.g., goal-setting, feedback, competition, games, message framing, and commitment), there is considerable variance across programmes in terms of how a particular behavioral strategy is being applied. Content also refers to the way that messages are constructed or framed within the programme, and includes the language, design, and images used in communications materials.
- D. **Identify and analyse the DELIVERY channels that were employed.** Delivery refers to the way that a programme is distributed to consumers. Variables within delivery that can impact programme effectiveness include *frequency* (e.g., weekly, monthly), *duration* (continuous, one-time), *timing* (new homeowners, changing seasons), *medium* (e.g., email, social media, in-person), and *messenger* (e.g., retailer, contractor, peer). These variables play key roles in determining the degree of audience acceptance and receptivity towards a programme intervention, yet they are often underexplored.
- E. **Determine how the case studies have been EVALUATED.** Was there *process and / or impact evaluation*? What *metrics and measurements* have been employed? Have *co-benefits* been assessed, and if, how? Was there quantitative and qualitative evaluation and (how) has it been triangulated? We will identify barriers to undertaking large-scale behavioural interventions in each of these case studies and highlight international best practice approaches and learnings.

To summarise our research process (see diagram above): Each phase includes both qualitative and quantitative research to marry inductive and deductive strategies of learning. First, the overarching programme or policy goals must be established and **aligned** in the context of the existing landscape of work and the mandates of key stakeholders. Second, the target **audience** and **behaviour** are **defined** through mixed-methods customer research and modelling. Then, the programme can be **designed** to address audience and behavioural needs and key **content** and **delivery** variables can be "pretotyped" via experimental and usability testing. Finally, once the programme has been optimised based on empirical data, it can be **deployed** and **evaluated** in a pilot study, using both process and impact evaluation to determine not only whether it worked but how it can be continuously improved over time.

## Management, roles and responsibilities

The project management of this Task will be undertaken by former Task 24 Operating Agent (OA), [Dr Sea Rotmann \(SEA – Sustainable Energy Advice Ltd, NZ\)](#). She will serve as the main liaison with the IEA DSM ExCo, funders, Project Partners, Chief Advisor and National Experts. Dr Aimee Ambrose of the University of Sheffield Hallam will be Chief Advisor (CA) of the HTR Task. [See Change Institute](#), led by CEO [Dr Beth Karlin](#) will serve as primary Project Partner (PP), further developing and testing the *See Change Institute process* and *Beyond kWh* toolkit to be used in this Task (Subtask 3). Other Project Partners (such as the University of Sheffield Hallam) and highly-engaged Task 24 experts will continue to be part of this work on a per-need (based on the country, sector and/or HTR expertise) basis. Current Task-sharing estimations in each Subtask are based on three financially-participating countries. We will use online project management tools such as *Teamwork*<sup>3</sup> to ensure all collaborators will undertake their fair share of work, as outlined in the Deliverables, below. We understand there needs to be some flexibility in terms of how the NEs and other experts and PPs choose to apply their time in the most meaningful and relevant manner. Using a real-time tracker linked to detailed Gantt charts will enable us to flag early any potential issues with under- or over-performance (see Risk Management).

### *The responsibilities of the Operating Agent (OA) include:*

- Overall management of the Task, including coordination, liaison between Subtasks, flow of information between participants, and communication with the ExCo;
- Responsible for the management and delivery of work performed under all assigned Subtasks, including meetings, status reports, deliverables, and budget oversight;
- Quality and risk management;
- Providing Task Status Updates at ExCo meetings, Annual Reports, and Final Task Report;
- Attracting funding for additional participant countries and field research pilots;
- Finding relevant international comparison studies for cross-cultural analysis;
- Disseminating the results of the work and promoting wider work of our experts within the IEA;
- Chairing Task workshops and meetings (with organisational support from relevant NEs) and presenting the Task at conferences, webinars, seminars and lectures;
- Research analysis, writing and publishing of peer-reviewed articles and technical reports;
- Co-supervising PhD students (with input from NEs) associated with the Task (see below);
- Maintaining close contacts with research related to this Task that is conducted in other TCPs or in other international organisations and research collaborations.
- Take primary role in drafting all project deliverables, with input from National Experts.

### *The responsibilities of the Chief Advisor (CA) to the Task include:*

- Supporting the OA during Task definition phase;
- Providing expertise on the HTR to the OA, NEs and other experts, where required;
- Support the OA with coordination of the HTR expert network (ST 1);
- Applying for PhD scholarship/s and recruiting and co-supervising PhDs to take part in this Task;
- Taking part in international Task workshops and disseminating results.

### *The responsibilities of the Project Partner/s (PPs) identified by the OA include:*

- Responsible for the management of work to be performed under assigned Subtask 3, including guidance, status reports and deliverables;
- Input into design, analysis and evaluation for funded field research pilots using the *See Change Institute process* and *Beyond kWh* Toolkit (Subtask 4);
- Manage and/or support country-specific pilots<sup>4</sup>, where relevant (Subtask 4);
- Collaborating with OA, PhDs and NEs on academic write-up and publications;
- Supporting the OA and NEs with general social science expertise and expert networks.

### *The responsibilities of the National Experts (NEs) include:*

- Support development of the HTR Task Work Plan;

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<sup>3</sup> <https://www.teamwork.com/>

<sup>4</sup> Funding for this work is not included in the Task and co-sponsorship would be required

- Track their time spent on each Subtask and flag any issues with the OA immediately;
- Contribute to the Task expert platform (Subtask 1);
- Organise one international expert workshop in their home country (funded by their country) over the course of the Task, attend other participating countries' expert workshops, and attend at least one international conference to (re)present the Task (Subtask 1);
- Manage and lead country-specific research efforts, identifying and analysing *ex-post* at least two (one per sector, around 5-6 pages in length) case studies (Subtask 2);
- Provide feedback to PP on research process (Subtask 3);
- Input into design, analysis and evaluation of country-specific pilot studies (Subtask 4); including feedback to any PhD-related work in the context of pilots;
- Identify experts from different Behaviour Changer sectors for the topic chosen as focus for field piloting, and pilot co-funding opportunities, if possible (Subtask 4);
- Support pilot team (PPs, PhDs, OA and cofunders) with coordination of country-specific field pilot, where applicable (Subtask 4);
- Provide the OA with feedback and information on the results of the work carried out by the various country experts;
- Provide contribution to the content and reviewing of all draft reports of the Task;
- Support the OA in disseminating the results of the work, including among their own networks.

The participating countries will formally assign appropriate national experts (NEs) to the HTR Task on their notice of participation (NPP) to the IEA Secretariat. There can be one, or more NEs (e.g. one for each of the main sectors that will be investigated here). How NEs will be funded for two person months per year is up to each country's ExCo. The NEs will help the OA choose the next layer of experts (the Behaviour Changers) that will be involved in the Task expert network (their involvement is expected to be in-kind).

#### *The responsibilities of the IEA DSM Executive Committee (ExCo)*

- The IEA DSM Executive Committee (ExCo) will oversee the successful management and implementation of this Task, including potential dispute resolution and mediation, if required;
- The IEA DSM ExCo (participating countries excluded) is asked to find the minimum funding (NZD5,000) for each of their countries to contribute to a chapter to the international publication or to agree to a bulk payment from the IEADSM common fund (Subtask 2a);
- The ExCo members of interested countries are asked to find (co)funding to formally join the Task as participating members;
- Participating ExCo members shall oversee their country contribution, including identification and relationship management of the NEs;
- Participating ExCo members shall support their NEs and other HTR country experts in any ways they see fit (either financially or in-kind) and organise and fund at least one international expert workshop in their country. They are invited to attend any Task expert workshops, but especially the one organised in their own country; and
- Participating ExCo members shall contribute to draft country publications, including choice of focus, content and dissemination to their agencies and other networks.

#### *The responsibilities of other Task co-funders*

This Task is expected to receive significant, and flexible co-funding arrangements outside of ExCo member agencies, especially for the field pilots (Subtask 4). Co-funders can come from any Behaviour Changer segments, e.g. *Decision-makers* in local government; *Providers* from utilities or heavy vehicle fleet transport industries; *Experts* from other research collaborations like H2020; *Middle Actors* such as facilities managers and commercial building estate contractors; and agencies we call "*the Conscience*" such as those focused on better health (e.g. reduction in respiratory disease from improving building stock) or other social outcomes (e.g. integration of refugees and other new immigrants, support for indigenous populations, fuel poverty etc.). Co-funders' responsibilities are:

- Collaborate with the relevant IEA DSM country ExCo and NEs to align co-funding and roles and responsibilities;

- Support pilot team with the management, coordination and implementation of pilots (Subtask 4);
- Identify any other means to identify and / or support possible field research pilots in this Task (e.g. by data sharing, in-kind expertise, access to resources, knowledge and capacity; access to other possible co-funding sources and wider networks etc.);
- If committed to undertake or support field research pilots, share access to (non-confidential) data and resources; support our OA, Project Partner/s or (National) experts in data collection and analysis; and contribute to report writing and dissemination, including among their networks.

Co-funders will have final say over removing any reference to commercially-sensitive information but will otherwise agree to share insights and data from field pilots via the open-access IEA DSM website.

#### *The responsibilities of PhD Students associated with the Task*

This Task has already attracted three fully-funded PhD students (an international one who will be based in the UK, one in the UK / Sweden and one in Spain / NZ) and the OA will co-supervise at least one of them, together with UK Chief Advisor Dr Aimee Ambrose and Swedish Expert, Professor Jenny Palm. They will get co-authorship (or primary authorship) on any papers or reports they have contributed to for this Task. The students will:

- Support report writing and dissemination of Task-related publications (Subtask 1);
- Undertake (primary) literature review on the HTR, and support definition and case study analyses (Subtask 2 and 2a);
- Support utilisation and testing of research process (Subtask 3);
- Support pilot team on field research collection and analysis of data on chosen focus topics in participating countries (Subtask 4);
- Input into design, analysis and evaluation of country-specific pilot studies (Subtask 4);
- Establish links between the Task and the EU-wide Horizon 2020 funded STEP (*Solutions to Energy Poverty*) project, where relevant.



## OUTPUTS & OUTCOMES (WHAT)

### Objectives of the HTR Task

The main objective of this Task is to undertake wide-ranging empirical research and field pilots on hard-to-reach energy users to allow Behaviour Changers (from government, industry, research, the service and the third sectors) to:

- Partake in a *global research collaboration* under the umbrella of IEA DSM (**Subtask 0**);
- Engage in, and have access to, an *international expert network* (**Subtask 1**);
- *Define HTR energy users in the residential and commercial*, collect & analyse case studies highlighting past and current work to better engage this user group (**Subtask 2**);
- Develop an *international publication* with participating and interested countries, including those outside the OECD, that attempts to analyse the proportion of energy users that would fall under the Task's hard-to-reach category and identifies some of the distinct groups and subgroups beneath the broader HTR umbrella. This work will be based on the case study analyses and definition work undertaken in Subtask 2, in participating countries (**Subtask 2a**);
- *Use and test the tools* highlighted in the Task 24 Toolbox for Behaviour Changers, including the *See Change Institute Process* to align, define, design and deploy better interventions geared at the HTR energy users identified in Subtask 2 (**Subtask 3**);
- Identify and, where possible, undertake voluntary *field research pilots* to take the theoretical learnings into practice (**Subtask 4**).

### Subtasks, and their objectives and deliverables

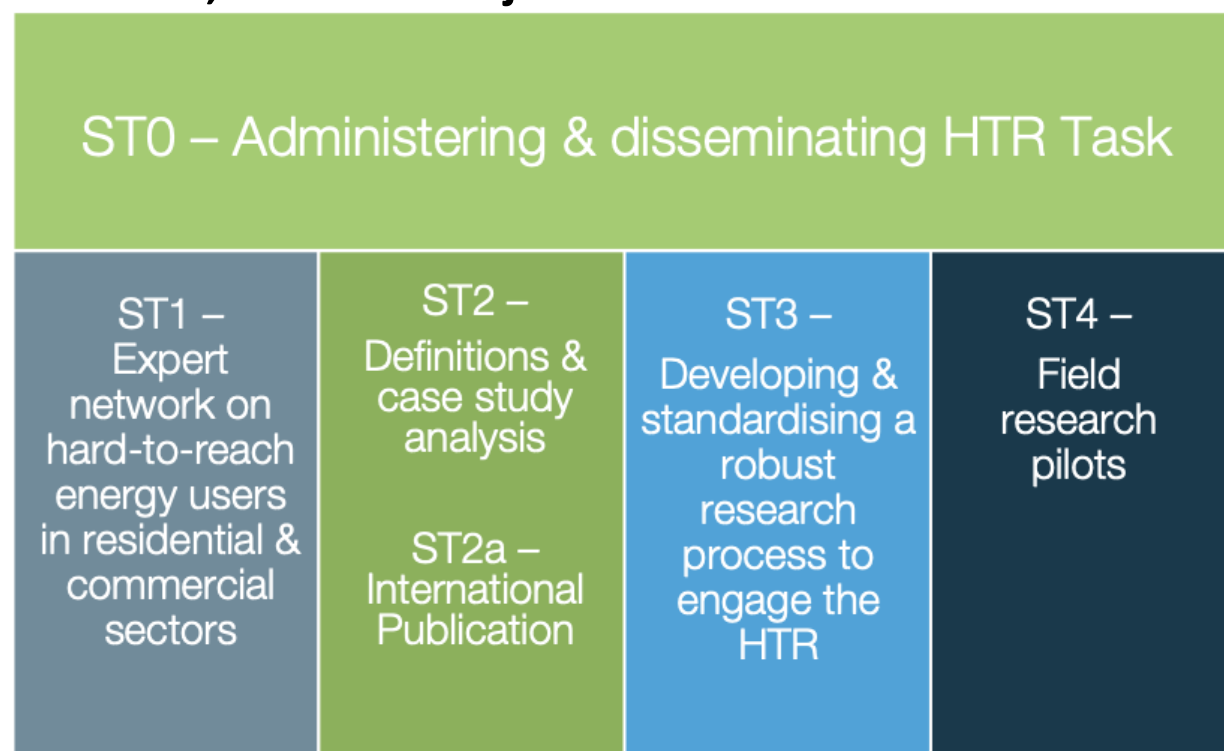


Diagram of HTR Task Subtasks

## Subtask 0 – Administration, management and logistics

Subtask Number	0 - Project administration and ExCo reporting
Start Date	Month 1
End Date	Month 36
Activity Type	Project Management and Coordination, ExCo feedback, Reporting, Risk management

### Objectives

- Work plan definition, country and national expert participation;
- Overall project coordination, including relationship and risk management;
- Attendance of ExCo meetings, IEA DSM conferences and reporting to IEA DSM ExCo;
- Project management, including time tracking, financial, legal and other administrative issues.

### Deliverables

- **D0: Initial work plan:** Delivered by Operating Agent (OA) with input from National Experts (NEs), Project Partner/s (PPs) and Executive Committee (ExCo)
- **Overall project organisation and management:** Delivered by OA
- **Contracting, legal and financial reporting:** OA and ExCo
- **Task Status reports, Annual reports:** Delivered by OA
- **Participation in IEA DSM ExCo meetings:** OA
- **Task flyers** – at the start, during and at the conclusion of the project: OA
- **IEA DSM Website updates:** OA
- **IEA DSM Task communications (e.g. blogs, newsletter):** OA, NEs, PPs
- **Communication with related IEA Tasks and other HTR projects:** OA, NEs and PPs
- **D1: Co-Supervision of PhD students:** OA and CA.

Roles and responsibilities (outlined in detail above)

The OA will lead this Subtask, with support from NEs, ExCo and other co-funders, and PPs, where needed.

Task sharing and expected person-months (pm) or days (d) for the total 3 year participation

Subtask 0	OA	CA	PP	Each NE	ExCo
<b>D0: Work plan definition (up front)</b>	3pm	3d	0.5d	3d	1d
<b>Project management</b>	6pm	5d	1	15d	1d
<b>ExCo Reporting &amp; Communication</b>	3pm	0	1.5d	2d	3d
<b>D1: PhD student co-supervision</b>	2pm	22d			
<b>TOTALS</b>	<b>13 months</b>	<b>1.5pm</b>	<b>3 days</b>	<b>1 month</b>	<b>5 days</b>

### Subtask 1 – Expert network and dissemination

Subtask Number		1 - Expert network and dissemination
<b>Start Date</b>	Month 1	
<b>End Date</b>	Month 36	
<b>Activity Type</b>	Networking and dissemination activities	

#### Background

Task 24 has developed a strong and successful expert network of over 400 Behaviour Changers from 20+ countries. We will build on, and expand this expert network with HTR experts. Our Project Partner SCI also has a very strong expert network, particularly in North America. Our National, and other HTR experts also have significant networks. We will combine all our networks to engage a global expert network of Behaviour Changers to participate, financially and in-kind, in this HTR Task.

#### Objectives

- Combine and grow our international expert network particularly in the field of HTR energy users;
- Widespread dissemination of this Task and its outputs;
- Continued 'matchmaking' and promotional / supporting activities for members of the expert network.

#### Deliverables

- D2: HTR Expert network
- D3: At least three international conferences and / or Task expert workshops open to all Behaviour Changers engaged in this Task (following successful model of Task 24);
- D4: At least two scientific, peer-reviewed papers in high-impact journals; technical reports, peer-reviewed conference papers, lectures, seminars, DSMU webinars etc.

#### Roles and responsibilities

The OA will lead this Subtask, with support from CA, PPs, NEs, ExCo and other experts and co-funders, where needed.

#### Task sharing for the total 3 year participation

Subtask 1	OA	CA	PhDs	PP	Each NE	ExCo / co-funders
<b>D2: HTR expert network</b>	2pm	5d	5d	2d	8d	1d
<b>D3: 3 international conferences / workshops</b>	1pm	6d	5d	5d	12d	1d
<b>D4: Two scientific papers, other dissemination efforts</b>	5pm	4d	1pm	15d	1pm	3d
<b>TOTALS</b>	<b>8 pm</b>	<b>15d</b>	<b>1.5 m</b>	<b>1 pm</b>	<b>1.5 m</b>	<b>5 days</b>

### Subtask 2 – Hard-to-reach energy user definitions and case studies

Subtask Number	2 - HTR definitions and case studies
Start Date	Month 2
End Date	Month 12
Activity Type	Definitions, collection & analysis of case studies from participating countries

#### Background

Using our expert network (ST 1), we will collate definitions of HTR in the commercial and residential sectors via a landscape analysis and stakeholder interviews in each participating country. We will also collect and analyse (using the ABCDE framework) at least two case studies per country that highlight how they each were addressed. PhD students will undertake a literature review of the primary literature on this topic. We will use the Task 24 Behaviour Changer Framework (Rotmann, 2016) to identify top issues of interest and relevant Behaviour Changers in each participating country. National Experts will lead each country's efforts on HTR definition and case study analysis. PhD students and OA will support landscape analysis and stakeholder interviews. Other experts and ExCo are expected to contribute to the production of outputs, leading to an international publication (ST 2a).

#### Objectives

- Overarching Task definition of HTR that encompasses the residential and commercial sectors and all users groups
- Individual country definitions of HTR in the 3 sectors
- Literature Review
- Participating countries: case study analyses, stakeholder and energy user interviews and / or surveys
- Deciding on top HTR focus group in each sector for all participating countries.

#### Deliverables

- D5: Overarching Task definition of HTR
- D6: Participating country reports that outline definitions, case studies and landscape and stakeholder analyses (to feed into Subtask 2a)
- D7: Literature review on the HTR in the residential and commercial sectors.

#### Roles and responsibilities

The OA will lead this Subtask, with support from PhDs, PPs, NEs, ExCo and other experts and co-funders, where needed.

#### Task sharing for the total 3 year participation

Subtask 2	OA	CA	PhDs	Each NE	ExCo / co-funders
<b>D5: Task definition of HTR</b>	1d	0	0	0.5d	0.5d
<b>D6: Country reports</b>	1.5pm	2d	1d	28d	3d
<b>D7: Literature Review</b>	0.5pm	3d	2pm	1.5d	2d
<b>TOTALS</b>	<b>2 pm</b>	<b>5d</b>	<b>2 months</b>	<b>1.5 months</b>	<b>5.5 days</b>

### Subtask 2a - International publication on HTR (TBD based on country interest)

Subtask Number	2a - International publication
Start Date	Month 6

<b>End Date</b>	Month 18
<b>Activity Type</b>	International Publication on HTR Energy Users in 3 sectors

#### Background

We hope to attract enough interest from additional DSM or G20 countries who do not want to formally participate in the whole Task to be able to develop this international publication - preferably in collaboration with the IEA Secretariat. We envisage around 12-15 countries in total are needed to warrant such a publication - as an edited book, for example. Financially-participating countries will feed in their Subtask 2 efforts. A small contribution from either each additional country (NZD 5,000 / ~ USD 3,500 / ~€3,000 per country) or, if the whole DSM TCP decides to partake in this Subtask, the DSM Common Fund (NZD 85,000 / ~€50,000) would be sufficient to develop a publication defining HTR energy users in different country contexts. It will highlight main case studies, policies or programmes currently underway to engage them in each country and undertake the secondary, desktop ABCDE analysis (see ST 2) to establish effectiveness. A small number (smaller than those undertaken for ST 2) of stakeholder and / or end user interviews are envisaged for each contributing country. We plan to invite G20 and emerging economies (4E) to contribute to this publication.

#### Objectives

- To include a wider range of developed and developing countries, including those outside IEA / OECD to participate in an international publication on HTR energy users;
- To collect different definitions and case studies and undertake high-level analyses of effectiveness, best practice and shared learnings;
- To estimate total effect size of HTR energy user group in the residential and commercial sectors in each country using stakeholder interviews and country statistics.

#### Deliverables

- D8: International publication on HTR energy users in 12-15 countries (at least).

#### Roles and responsibilities

The OA will lead this Subtask, with support from PhDs, PPs, NEs, ExCo and other experts and co-funders, as well as the IEA Secretariat and G20 Working Tasks, where needed.

#### Task sharing for the total 3 year participation

Subtask 2a	OA	PhDs	PP	Each NE	ExCo
<b>Identifying additional countries</b>	10d	0	0	0	1d
<b>Case study analysis and expert interviews in each country</b>	1.5pm	1pm	2d	0 (part of ST2)	3d
<b>D8: Finalising publication</b>	0.5pm	1pm	0	1d	1d
<b>TOTALS</b>	<b>2.5 months</b>	<b>2 months</b>	<b>2d</b>	<b>1d</b>	<b>5 days</b>

#### Subtask 3 – Standardised and validated research process

Subtask Number	3 - Research process
<b>Start Date</b>	Month 6
<b>End Date</b>	Month 36
<b>Activity Type</b>	Develop and validate standardised research and evaluation process

## Background

Task 24 Phase II has developed a Toolbox for Behaviour Changers (Subtask 8), which provides many insights into tools, research and evaluation methodologies on how to “do” behaviour change from A to Z. Task 24 project partners, the Californian See Change Institute (SCI), are currently developing and testing the See Change research process with utility partners in North America. The Task 24 and SCI tools and processes can be combined to develop and validate a standardised way of how to best engage HTR energy users in field pilots (Subtask 4). These need to be specified to apply to the HTR focus group that was mutually agreed-upon and to field research pilots with varying amounts of co- and in-kind funding and support.

## Objectives

- To develop a standard, internationally-validated research process for behavioural interventions and field research pilots on HTR energy users in the residential & commercial sectors;
- To provide a standardised process to undertake cross-country case study comparisons.

## Deliverables

- D9: Report on the standard research process recommended for testing in field research pilots (Subtask 4) and validation of the process using those pilots.

## Roles and responsibilities

The Project Partner SCI will lead this Subtask with support from the OA, NEs, PhDs and other experts.

## Task sharing for the total 3 year participation

Subtask 3	OA	CA	PP	PhDs	Each NE	ExCo / co-funders
<b>Development of standard process</b>	5d	3d	0.5pm	0	1d	0.5d
<b>Validation of data collected in ST4</b>	5d	2d	0.5pm	0.5pm	3d	1d
<b>D9: Final Report</b>	10d	5d	1pm	3d	6d	1.5d
<b>TOTALS</b>	<b>1 pm</b>	<b>10d</b>	<b>2 pm</b>	<b>0.5 pm</b>	<b>10 days</b>	<b>2 days</b>

#### Subtask 4 – Field research pilots in participating countries

Subtask Number	4 - Field pilots
Start Date	Month 12
End Date	Month 30
Activity Type	Field research piloting, including evaluation

#### Background

The standardised process developed and validated in Subtask 3 is hoped to be tested in field research pilots on the chosen priority areas each participating country or co-sponsor has agreed upon. Provided that commitment and co-funding are secured, field trials are expected to take around 18 months each and can be co-sponsored by industry (e.g. utilities), government (e.g. ministries of social development, energy or health), research organisations (e.g. H2020 STEP programme), or the third sector (e.g. social organisations focusing on refugee integration, indigenous communities or fuel poverty). The all-important Middle Actors - often contractors or social / health agencies with direct end user access, will be identified and engaged by the pilot team in each country / sector to help administer field research trials (as part of the *delivery* part of the ABCDE of behaviour change). The Task 24 Behaviour Changer Framework will be used to visualise the socio-ecology of each country and topic of focus and facilitate multi-stakeholder collaboration at the start of each pilot (see, for example Cowan et al, 2017).

If the necessary co-funding to develop such pilots cannot be found in one of the participating countries, the NEs and ExCo will choose a current or past field pilot or programme on one of the chosen priority areas and assess the research process developed in ST 3 *ex-durante* or *ex-post*. This will be less rewarding than a fully-fledged pilot co-created and implemented *de novo*, but will still garner important insights and learnings to support testing and validation of our proposed research process. We expect all participating countries to try their best to develop a fully-fledged pilot.

#### Objectives

- Proof-of-concept of the research process developed in Subtask 3 in the field;
- Evaluation of success of interventions and (shared) learnings;
- Using a *Collective Impact Approach* to facilitate multi-stakeholder collaboration;
- Engaging the hard-to-reach and connecting them with the relevant organisations and individuals, policies and programmes that can help them improve their energy use and consumption.

#### Deliverables

- Co-funded, voluntary field research pilots on one of the main topics of focus chosen by participating countries OR identify relevant field pilots currently underway or recently completed;
- D10: Evaluation of field pilots (including *ex-durante* or *ex-post*, if needed) and reports with recommendations, including policy briefs for each participating country.

#### Roles and responsibilities

The OA will lead this Subtask, with support from PhDs, PPs, NEs, ExCo and other experts, co-funders and Behaviour Changers. Co-sponsorship can take several forms and is not expected to come (only) from ExCo funders but can also involve non-state actors: direct funding, in-kind or Task sharing support, access to end users and / or data, providing internal resources and capability for data collection and analysis etc.

Task sharing for the total 3 year participation

Subtask 4	OA	CA	PP	PhDs	Each NE	Pilot funders
Identification of field pilots & co-funding	1pm	5d	2d	10d	5d	0.5pm
Project management of field research pilots, data collection	3pm	5d	0.5pm	6pm	10d	1.5pm
Data analysis	1pm	5d	1pm	3pm	3d	2d
D10: Final Reports for each pilot	3pm	5d	0.5pm	3pm	12d	3d
<b>TOTALS</b>	<b>8 pm</b>	<b>1 pm</b>	<b>2.5 months</b>	<b>12.5 months</b>	<b>1.5 pm</b>	<b>2 pm</b>

## Deliverables

Subtask	Deliverable	Deliverable Name	Deliverable Type
0	D0	Work plan defined and signed off	Report
0	D1	Co-supervision of PhD students	PhD theses
1	D2	Expert network and dissemination	Various
1	D3	At least 3 international expert workshops	Workshops
1	D4	2 peer-reviewed scientific papers	Scientific articles
2	D5	HTR Definition	Slide deck
2	D6	Country definitions and case study analyses	Reports
2	D7	Literature Review	Report / Article
2a	D8	International publication on HTR	Book
3	D9	Standardised research process	Report / Article
4	D10	Field research pilots	Reports, Policy Briefs



## Deliverables by Year

### Year 1 Deliverables

- Synthesis of the international literature on HTR programmes.
- A report detailing different HTR definitions and relevant case studies from participating, and supporting countries. This synthesis of HTR definitions will include an overview of participating countries' mix of HTR groups and segments.
- A synthesis of survey results from stakeholders and end users that enable a better understanding of the contextual factors affecting HTR energy users in different countries; initial assessment of the different HTR groups and segments that participating countries are primarily trying to reach; identification of which of these HTR segments are common across multiple sponsor organisations and, conversely, which HTR groups are less conducive to addressing through this international collaboration.

### Year 2 Deliverables

- Development of a mutually agreed-upon research process based on Task 24 Toolbox for Behaviour Changers; identifying field pilots to implement and evaluate process and impact.
- Guidance on how to encourage behaviour change of HTR users in the energy sector, how to align different "Behaviour Changers", design and deploy field trials and evaluate interventions to prove real, long-term change on this difficult end user group has occurred.
- Continued assessment of the different segments of HTR for participating countries and which of these segments may be the most promising and less promising to address.

### Year 3 Deliverables

- Field research pilots in all participating countries following strong social science process that can help identify and engage the HTR groups that may be the best candidates for behaviour change through energy efficiency and DSM programmes and interventions.
- International publication on hard-to-reach energy users in residential & commercial sectors, possibly in collaboration with IEA Secretariat.
- Final country reports and overarching country comparisons, including insights into which HTR groups may be the most promising to engage in energy efficiency and DSM interventions, and the social science techniques and / or engagement approaches to use in motivating some of these specific segments.

## OUTCOMES AND BENEFITS TO ALL PARTICIPANTS

### *General outcomes*

By collaborating on this international research Task we will gain:

- Global networking and collaboration to share learnings and stop duplicating efforts;
- Access to cutting-edge expertise, tools and resources which will aid cross-country comparisons;
- Co-creation and promotion of new solutions to old problems, turning participating countries into leaders on how to engage this important and underserved energy user group;
- Insights for industry into serving their "Hard-to-Reach" customers by leveraging learnings from a wide range of different countries', sectors' and research disciplines' expertise and case studies;
- Three PhDs associated with this Task researching in depth various aspects of the HTR;
- Stakeholder and end user research that enables a better understanding of the contextual factors affecting HTR energy users in different countries and sectors, allowing us to better target them;
- Guidance on how to better apply behaviour change interventions on this HTR user group in the residential and commercial energy sectors; including how to align different "Behaviour Changers" to design and run field pilots and evaluate interventions to prove real, long-term change;

- Analysis into how large this energy user segment could be in different sectors, fuels and countries - this should drive changes to government policies (including regulation/legislation) and industry / community sector programmes paying more attention to this underserved user group;
- More capacity to apply behaviour change insights to policy making and real life interventions in IEA DSM countries, including through collaboration with the G20, IPEEC and Energy Efficiency in Emerging Economies (E4) programme, as well as major energy efficiency and behaviour change collaborations such as ACEEE, eceee, BECC, BEHAVE and selected H2020 programmes;
- High quality and accessible dissemination of HTR case studies and field research - becoming the depository of global knowledge on hard-to-reach energy users.

### *Expected benefits for IEA DSM*

This proposed Task goes somewhat beyond the traditional Task structure, where a small number of countries fund individual Tasks with rather narrow research objectives. Instead, it utilises flexible (co)funding strategies, including opportunities for voluntary contributions to specific Subtasks (particularly, Subtask 2a and to some extent, Subtask 4). This work will continue to build on the strong brand and reputation of Task 24 but with particular focus on an energy user group that may have collectively been in somewhat of a blind spot in past behavioural and energy efficiency interventions.

This Task will provide ExCo members with:

- A strong platform for the IEA DSM Programme to stand out among the largely-technology focused TCPs;
- Leadership in engaging hard-to-reach energy users and communities, HTR experts and other Behaviour Changers in whole-system collaborations that focus on structural issues which we need to change to accommodate climate change and energy efficiency targets;
- Improved political buy-in for their countries' policy development via policy briefs, which include policy recommendations that can improve the effectiveness of existing policy interventions and help better design and implement new ones;
- Coordination with the IEA Secretariat and other international bodies interested in this area of research (e.g. G20, Horizon 2020, eceee, energypoverty.eu, ACEEE, BEHAVE, BECC...);
- Ability to collaborate with non-state actors across multiple countries / sectors that have the resources and mandates to conduct large-scale behavioural field trials;
- Ability for non-participating ExCo members to contribute to an international publication on the hard-to-reach energy users in their countries;
- Interesting webinars for DSMU;
- More flexibility for the Operating Agent to engage with non-state actors and non-IEA DSM countries to collect a wider range of research and insights, including into developing countries.

### *Benefits for Behaviour Changers and co-funders to join this Task*

Non-state actors who are in active development of a behaviour change programme or intervention will be invited to join the project as "implementation" partners. These Funders and *Implementers* will work closely with the *Researchers* (OA, NEs, PhD students and Project Partner/s) on the field pilots determined in Subtask 4. At the end, the Implementers will have conducted a new, or assessed a current behavioural field pilot and the researchers will have completed formative, summative, outcome and process evaluations with guidance on how to replicate and / or scale-up their pilot.

In addition, all experts and Behaviour Changers joining this Task (formally, or in-kind) will partake in the following benefits:

#### **Opportunities for Global Networking and Collaboration**

- Implementers will become part of the combined expert platforms with 100s of Behaviour Changers from many different countries, research disciplines and sectors;
- They can bring their own DSM issues and get cutting-edge, tailored advice and research support for the entire chain of designing, implementing, evaluating, reiterating and disseminating behavioural interventions that work;

- They will gain access to, and participate in the [IEA DSM University](#) including developing and disseminating their field pilots in promoted webinars, peer-reviewed publications and technical reports;
- They will gain access to global dissemination and cross-country case study comparisons via the highly-reputable IEA network.

#### Access to Cutting-Edge Tools and Resources

- Behaviour Changers will gain improved knowledge and understanding on what different models and theories of behaviour change are available and when and how to best use them in practice;
- They can learn from and share, directly and via the IEA DSM network, best practice case studies and stories;
- They can get access to, and expert support for, the standardised, robust research process developed in this Task;
- They will get expert facilitation and backbone support to develop the *Collective Impact Approach* in practice, tailored to their stakeholders, mandates and needs.

#### Co-creation and Promotion of New Solutions to Old Problems

Behaviour Changers will gain access to a highly respected global brand. This includes being invited to collaborate on joint behaviour change publications in DSM including, but not limited to:

- Re-framing the big issues facing HTR energy users and the agencies trying to reach and engage them, together;
- Learning how to apply good research process to design, implement and evaluate better interventions and share learnings via cross-country case study comparisons;
- Reducing duplication of efforts by learning from real-life field research so we can move from individually-focused, programme-level approaches to collaborations aimed at the common goal of achieving systemic, societal changes with collective community and citizen participation at its core.

## PROPOSED BUDGET (BASED ON INITIAL 3 COUNTRIES)

Even though we expect at least another 2-3 IEA DSM countries to join this Task over its lifetime, we have to base the initial budget on the first three countries that signed up to participation. Following our experience in Task 24, where we started with 4 countries initially but had 11 countries participate overall (8 in Phase 1, and 6 in Phase II), we chose to keep the budget the same, independent of how many countries will ultimately participate. This is the absolute minimum budget needed to undertake the work described in this Work Plan. Any additional country funding will reduce some overheads but will increase the complexity of the OA's work including time, travel costs, project management, administration and communication costs etc. Depending on how many additional countries will join this Task, and at what stage of completion, there may be a small time over-run (at no extra cost to participating countries).

**Original country participants will have significant benefits:** They will be able to co-create the Task Work Plan and shape the overall approach, have more time to develop expert networks and attract co-funding, and will be able to promote this work within their own country by hosting one of the international expert workshops. They will also get preference in terms of finishing their country contribution first (e.g. should there be a small extension of the Task to incorporate new countries that joined at a later stage). Later country participants will be supported to play catch-up by the OA, and will benefit from the learnings and insights of work that has been already undertaken by other countries.

### Budget break-down per country

- **Cost sharing: NZD 50,000 per year per country** (~USD 35,000 or ~€30,000) for 3 years, which includes Operating Agent salary, administrative and overhead costs, communications and web expenses, and travel to ExCo meetings, expert workshops and relevant conferences etc.

- **Task sharing: 2 person months National Expert time per year**, plus hosting of one expert workshop in one country each year (to be hosted by the US in 2019, Sweden in 2020 and New Zealand in 2021).
- **Additional co-funding** for field research pilots - **ultimate cost depends on size of pilot and co-funding**. This can involve non-state actors such as Universities, NGOs, community groups, utilities and other industry actors. Co-funding can include direct funding, in-kind support with data and expertise, providing resources such as e.g. PhD students or access to research subjects or current or recently-completed pilots etc.

## PROPOSED TIMELINE

Based on 3 participating countries (see comments above). A detailed GANTT Chart will be developed and incorporated into online team and project management tools as soon as the Task commences.

ST	2019	2020	2021	2022
0	[Solid blue bar]			
1	[Solid blue bar]			
2	[Bar]	[Bar]	[Bar]	[Bar]
2a	[Bar]	[Bar]	[Bar]	[Bar]
3	[Bar]	[Bar]	[Bar]	[Bar]
4	[Bar]	[Bar]	[Bar]	[Bar]

## RISK MANAGEMENT

The Risk Management table below outlines the main risks and risk mitigation measures that will be taken. These risks are informed by seven years of OA and ExCo insight from running a high-performing IEA DSM Task with 11 participating countries, and support and input from over 20 countries and 400+ experts overall. This Work Plan has been designed with strong input from National Experts and potential country funders, as well as other HTR and behaviour change experts from ten countries. It aims to minimise impacts by providing maximum flexibility in areas that will be the hardest to achieve, as they rely on additional external support (especially field piloting in Subtask 4 but also the (IEA) publication in Subtask 2a). Past experience in Task 24 has shown that high flexibility and a can-do approach by the OA will open up opportunities for co-funding and collaboration that cannot currently be envisioned or foreseen in its entirety. We trust that our successful management and high-quality outputs in Task 24 mean that a similarly supportive environment will be provided by ExCo and country funders, here.

<b>Risk</b>	<b>Likelihood</b>	<b>Impact</b>	<b>Risk category</b>	<b>Risk Mitigation Measures</b>	<b>Risk category, post mitigation</b>
Lack of requisite expertise with which to deliver required services	Low	High	Medium	Strong Project Partners and existing expert network and relationships with national and other experts and Behaviour Changers.	Low
Inability of OA and NEs to work together	Low	High	Medium	Successful completion of Task 24 has shown that OA will be able to deal with underperforming NEs. ExCo will have new conflict mediation strategies. Time tracking will flag issues early.	Low
Sudden unavailability or withdrawal of NE	Medium	High	High	NEs are aware of responsibilities and are expected to find replacement. Strong Task 24 expert network to draw on, if needed. ExCo support to find replacement NE expected.	Low
Sudden unavailability of OA or other key research staff	Low	High	Medium	Project Partner/s could allocate new OA from their available pool of highly-qualified researchers	Low
Inability to attract field pilot co-funding	High	Medium	High	It is expected that co-funding for new pilots may be difficult to find in all participating countries. That is why the co-funding arrangement is highly flexible, allowing for different collaborators and kinds of support. We can also apply the research process developed in ST3 to current, or recently-completed pilots	Medium
Project delivery timeline overruns, extra burden from additional countries joining later	Medium	Medium	Medium	It is expected that more countries will join once the Task is underway. Any time overruns will be at no extra cost to participating countries and we will finalise countries who started early, first. Task 24 was only 6 months over despite having 3 countries join late.	Medium
Budget overruns	Medium	High	High	Project to be delivered on fixed-price total basis, OA has to find additional funding unless it is out of their hands (see below)	Low
Countries not paying full contribution	High	High	High	OA will ask ExCo to intervene to ensure all countries pay full Task participation fees, unless agreed otherwise	Medium

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## **ENERGEY-SECTOR BEHAVIOURAL INSIGHTS PLATFORM**

- Moira Nicolson, Ofgem, UK
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### **SYNOPSIS**

This Task will bring together government officials and other experts working on the application of behavioural insights in the energy field. It will enable the sharing of knowledge and experience and will result in the development and dissemination of guidance based on case studies and theory. The Task will develop guidance on both the application of behavioural insights (for example from behavioural economics and psychology) and on the development of trials, including how to move beyond pilot projects to broader policy implementation. Importantly, the task will disseminate guidelines and examples of best practice in evaluating the energy savings/efficiencies associated with energy behaviour change programs.

### **CONTEXT**

Global drivers: Over the last decade, several countries have set up Behavioural Insights teams to work on the application of the lessons from behavioural economics and psychology to the development and implementation of government policies. In some countries, dedicated team have been instituted within energy or environment departments; in others, central teams at the heart of government look across a portfolio of issues including energy. These teams have been drawing upon empirically verified research into phenomena such as loss aversion, bounded rationality, optimism bias, social norming, habitual behaviour and hyperbolic discounting. As the lessons from policy mount and more countries begin to look at how to implement behavioural interventions, there is a need to collate experience and develop guidance to enable better policy making.

In addition, many of the existing policy programmes which governments have put in place to reduce carbon emissions rely fundamentally on changing behaviour. For example, studies (James & Ambrose, 2017, Fowle & Greenstone, 2015, and Allcott & Greenstone, 2017) have shown that the uptake, and effectiveness, of retrofit policies are strongly influenced by human behaviour. This task will work to gather and disseminate best practices for designing effective programmes that use behavioural insights to deliver these objectives.

DSM Strategy alignment: highly aligned - focussed on the application of behavioural interventions to achieve energy policy aims, including technology take-up, the more efficient use of technologies and the provision of flexibility services. A number of countries are currently in the midst of trialling initial DSM programs to understand consumer's willingness to engage in DSM programs and ultimately determine the impact of these programs. For example, Eirgrid (2019) have recently completed a field trial testing the effectiveness of a DSM program in Ireland. While it is important that feasibility trials are conducted to demonstrate the technological and logistical ability to implement these programs, it is also important that these trials are robustly designed to allow for causal inferences to be drawn and for policymakers to identify 'what works'.

This platform will help to share early insights on such projects, as well as guidance on the design of experiments, which will increase the robustness of these early but important trials.

Cross-TCP linkages: Potentially to other end-use TCPs, e.g. 4E on products policy, EBC on buildings, HEV on electric vehicles, HPT on heat pumps, ISGAN on smart meters, all of which are interested in the behavioural aspects of their particular technologies.

Who are the global leaders?: United Kingdom (former Cabinet Office team and now social enterprise, the Behavioural Insights Team, and teams embedded within the UK energy department (BEIS) and energy regulator (Ofgem) that form part of the cross-Government Behavioural Insights Network); United States (home to academics such as Nobel Prize winner Richard Thaler and Dan Ariely as well as the former head of the US Government BI unit, Mayar Shankar [now Global Head of Behavioural Science at Google]). The Sustainable Energy Authority of Ireland is one of the first energy agencies to develop a dedicated team of behavioural scientists. Japan, Australia and the Netherlands are all developing policies in the energy sector drawing upon behavioural insights.

Why us? International fora to share information on Behavioural Insights exist through the BX conference series, and the OECD's work in this area. There is also a large literature applying behavioural insights to fields outside of energy, most notably health and personal finance. The BECC and BEHAVE conferences provide a forum for sharing information across the behavioural sciences on energy and climate change related issues. However there is no international collaborative research platform specifically devoted to developing guidance and best practice on energy-related behavioural insights, which is a major gap because the solutions developed in health and personal finance cannot be readily applied in energy because behaviour is strongly context-dependent.

Why now?: Participants at the joint IEA/PEEC/G20 workshop on behaviour change for energy efficiency in September 2018 expressed interest in taking forward work on behavioural insights through the IEA Demand Side Management Technology Collaboration Programme (DSM TCP). These countries felt that there could be much to gain from sharing experiences, collecting case studies and developing guidance for each other's benefit and to help countries that were considering using behavioural insights for the first time. Now, more than ever, we are expecting consumers to take a much more active role in the energy system than they do at present. Although the sector is filled with experts able to solve the technological barriers to a low carbon energy system, greater collaboration between social scientists and behavioural insights practitioners is needed to ensure that these expectations become a reality.


In addition, a recent paper by Wilson et al. (2014) has highlighted that there are strong biases in the 'understanding homeowner's motivations for retrofitting' literature. The majority of recent research has taken a limited framing of the problem when considering reasons why homeowners may not retrofit their home. Given the pressing timelines associated with reducing emissions from the residential sector, it is important that research approaches are expanded to identify the real factors influencing people's energy behaviour so that more effective policy solutions can be developed.

Which of us? The UK and Ireland have taken the lead in developing this revised concept note with input from the IEA Secretariat. The Netherlands and Australia have also attended teleconferences and shown interest in developing the proposal, along with non-TCP members, Japan and Canada.

## AIM AND OBJECTIVES

< Well-defined objectives and realistic deliverables, best met through international collaboration [– this addresses the point around the need for value add from going beyond what might be being done domestically or at European level.]>

- To foster an organisational culture in which human behaviour is considered at the start of the policy process and embedded throughout a multi-disciplinary policy making process (a 'people first' approach)
- To share best practice in the application and evaluation of behavioural insights to facilitate the transition to a low carbon energy system
- To demonstrate the many tools based on behavioural insights, that can be used to help steer

- 
- behaviour towards a smarter and more sustainable energy system
  - Guidance to aid capacity building
  - Establish BI centre of excellence (platform)
  - ? Advice on BI governance models
  - ? Knowledge transfer from outside energy sector

## **EXPECTED OUTPUTS**

- Influencing sessions with senior leaders e.g. presentations and workshops with ‘thought leaders’
- Workshops and training exercises (theoretical)
- Peer group knowledge exchanges (before/during/after ‘live trials’)
- Guidance documents and other materials
- Centre of excellence platform (website at first, could expand at later stage)

# BEST PRACTICES IN DESIGNING & IMPLEMENTING ENERGY EFFICIENCY OBLIGATIONS 2.0

Jan Rosenow, RAP

## SYNOPSIS

Energy Efficiency Obligations (EEOs) are becoming more and more popular as a policy instrument to deliver energy efficiency gains. The growing and relative importance of EEOs is demonstrated by recent research. The IEA's research carried out by RAP in 2016/2017 found that the number of Energy Efficiency Obligations (EEOs) has quadrupled over the last ten years, while investment stimulated by them has risen six-fold, to USD 26 billion in 2015, which is around 10-15% of global energy efficiency investment. This makes EEOs probably the most important policy instrument after standards in terms of driving uptake of energy efficiency.

Clear policy guidance such as provided in the IEA DSM TCP report "[Best practices in designing and implementing EEOs](#)", published in 2012, is critical for the sound design and implementation of EEOs. What distinguishes EEOs from other policy instruments is that, by giving market actors the freedom to choose the measures and delivery routes that work best for them, the market as a whole is able to discover the most cost-effective way to achieve the outcomes set out by policy makers. That freedom puts a premium on good policy design and implementation, including strong monitoring, verification and evaluation. Sharing knowledge across jurisdictions will be central to the success of the next wave of policy making in this area.

The 2012 best practice paper for EEO design and implementation, produced by RAP as part of Task 22, was very well received and placed the TCP at the forefront of work in this area. Now, with the energy sector in transformation, and new implementation issues emerging, the time is right to dig deeper on the issues facing countries with EEOs and those considering their design.

## CONTEXT


Global drivers: Energy efficiency obligations can play a key role in delivering energy policy goals, whether they be to save energy, access cost-effective energy resources, reduce carbon emissions, develop energy service markets or tackle fuel poverty. As their popularity increases and energy policy objectives evolve, new design and implementation questions are arising.

DSM Strategy alignment: highly policy driven; link to behaviour (how to include behavioural measures in EEOs); link to digitalisation (understanding the scope for integrating "pay for performance" principles and the adaptability of EEOs to changing energy systems in which the value of efficiency will vary by time and place).

Cross-TCP linkages: Potentially all end-use TCPs; specifically – [4E](#) and [EBC](#) given the potential for the use of standards and labelling programmes to inform savings estimates and the traditional focus of EEOs on the buildings and products sectors.

Who are the global leaders?: Several US States (e.g. Rhode Island, Massachusetts, California), France, Italy, United Kingdom, India (PAT Programme)

Why us? Already recognised for previous work in this area; have leading expertise at RAP; a number of member countries have obligations (Australia (4 States/Territories); India; Ireland; Italy, Korea; United Kingdom; United States (many states)); other member countries have actively considered implementing obligations (Netherlands, Sweden); non-member countries may be interested to join as a result (e.g. Canada



has an obligation in one state). The 2012 report has been used by policy makers and their advisors in many jurisdictions around the world which we know from conversations with DG ENER, EBRD, GIZ and USAID. We believe that a follow-up report would be equally well-received.

Why now?: In Europe, Member States are preparing their policy frameworks for the 2021-2030 period; in India the results of the PAT Programme are worth analyzing; in the United States and Australia policy makers are looking to evolve policy to variations in the value of efficiency by time and place.

Which of us? RAP would take on the Operating Agent role for the Task in lieu of paying membership fees, as was the case with Task 22. Participating countries would be expected to attend biannual workshops on specific issues and prepare material to present at these events.

## **AIM AND OBJECTIVES**

- To provide clear and globally applicable guidance for policy makers on the design and implementation of EEOs
- To test the existing DSM TCP/RAP guidance to identify areas where it is no longer relevant or where further details are needed
- To dig deeper on a set of issues deemed by participants to deserve further attention. At this point, the issues might include:
  - An analysis of the experience with pay-for-performance and “EM&V 2.0”
  - Best practices related to using EEOs in the wider policy mix
  - How to adapt EEOs to changes in the value of efficiency by time and place
  - How to operate trading mechanisms

## **SUB-TASKS**

- Sub-tasks would be formed to investigate each of the issues deemed worthy of in-depth study

## **EXPECTED OUTPUTS**

- Updated guidance on the design and implementation of EEOs
- Individual papers on each of the sub-task issues
- Knowledge sharing with policy makers and other experts would share information and reach consensus on the appropriate related guidance.

# WHAT'S IN AN ALGORITHM? TOWARDS INCLUSIVE AND USER-CENTERED DEVELOPMENT FOR ENERGY OPTIMIZATION (*work title*)

Proposed by Dr. Sylvia Breukers (Duneworks), Dr. Tracey Crosbey (Teesside University) and Dr. Ruth Mourik (Duneworks)

A challenge for the years to come in the developments of various types of energy flexibility contracts and programmes is to ensure that these are aimed not only at reaching optimal results for the grid and overall energy system, but also ensuring that the energy transition is an inclusive societal transition in which energy justice considerations inform the (development of) technical solutions.

This Task aims at uncovering how institutional factors shape assumptions on users and value and how these are being designed into technology and more specifically algorithms, used for more flexibility in energy consumption and production patterns and volumes, but also uncovering what these assumptions are so that “users are empowered to challenge the ways in which “existing political, economic, and cultural factors shape technological innovations; acknowledging the possibilities for developing strategies to steer the implementation and use of technologies in ways which engender social inclusion and environmentally sensitive consumption patterns.” (Crosbie 2009:24)

## MOTIVATION

Considering that the energy transition is first and foremost a societal challenge, technological innovation needs to be informed by a good understanding of social dynamics, societal needs and possibilities to have a say. We are at the forefront of a radical change in the ways in which households and other medium-level actors consume, produce, pay for and choose energy consumption options, whereby the radical changes are strongly influenced by the exploitation of new innovative technological ‘solutions’ that are brought on the market by a diversity of new and incumbent techno-energy sector businesses. The design and consumption of these technologies, as well as the ways in which they contribute to newly emerging user and business practices cannot be seen as separate from issues like access to energy as a basic social right/common (which means that the market alone cannot be held responsible for a just allocation of value).

Therefore, there is a need to investigate, share, discuss and disseminate what can be learned from innovative pilots and other projects so that notions on users, value etc are inscribed in them and the risks and benefits and their distribution resulting from those inscribed notions become clear and can be discussed in a public and societal debate setting. Thus we can avoid technological systems that are based on algorithms that help sustain or exacerbate social exclusion. And we can help develop a system that supports algorithms that can help overcome social barriers and counter processes of marginalization.

Assumptions on how new DR and DSM interventions will affect residential volume and patterns of energy consumption often are built around a simplistic acceptance of the capacities and capabilities of new ICTs as presented by those IT companies developing them (based on their promotional literature). This implicitly assumes that ICTs are used as their designers imagined, not taking into account the extent that the use of technology is influenced by the contexts in which they are used (Crosbie, 2016). In addition,

there is a need to learn how institutional contexts affect the settings in which algorithms for end-user DR are developed and how that affects the ways in which assumptions are adopted about users, their behaviours, distribution of costs, benefits and risks is scripted into these algorithms. Research has shown that technology development and implementation in the area of flexibility through DR and DSM is based on the developers'/designers':

1. Expectations of market developments (e.g. for DR, aggregation of household level flexibility; the possibilities to earn profits in this market by acting as developers/intermediaries)
2. Assumptions about the behaviours of the different types of end-users/consumers (within households for instance) in response to the technologies (e.g. acceptance of changes in comfort; willingness and ability to actively participate in DR or DSM)
3. Assumptions about the organisational context (e.g. in Blocks-of-buildings) where meso-level solutions are envisaged (e.g. the extent to which building managers/owners are able and willing to participate and see added value for themselves)

Concerning points 2 and 3, mismatches can result in performance gaps (in relation to the expected responses, profits, acceptance,...etc) and in disappointments for all sides. For 1, there is the issue of how this market is structured, and how the proposition developed, including the algorithms developed and the baseline definition process, allocate value to respectively the end-users, intermediary partners (e.g. aggregators; ESCOs) and technology developers (who may or may not be the same actor as the intermediaries), DSOs, TSOs, etc.

## AIMS & OBJECTIVES

There are many baseline calculation methods for DR but most these are mostly developed for the industrial and commercial markets and are not directly transferable to the residential market (Saehong 2015). The ongoing trends in smart grid solutions that enable Demand Response and other flexibility programmes at the level of buildings, organisations and households, raise different questions and issues compared to industrial DR which has to do with the multitude of (indirect) users, the multitude of small loads and the practices and routines that may need to change when participating in flexibility programmes.

This new task will focus on DSM and DR targeting the meso-level of e.g. Blocks-of-Buildings as well as the micro-level of e.g. households and single buildings.

When pro/consumers can offer flexibility in small loads on aggregator platforms for some sort of reward, this in principle could be a win-win-win situation (e.g. the consumer earns some money; the aggregator also; RES are enabled; and the grid is supported in maintaining its balance). Win-win-win-win situations between these four perspectives are however not self-evident nor likely to occur. The task aims to enable the development of smart solutions and the underpinning algorithms in such a manner that the solutions meet both the aims of energy optimization from a grid stability perspective, an ecological perspective (e.g. preferential treatment of distributed renewable energy resources), an economic perspective (i.e. financial savings or earnings) and a social justice perspective (i.e. the equitable distribution of benefits and dis-benefits due to DR and DSM for energy optimisation).

The ways in which the technologies and software used for energy optimization are (supposed to) allocate value and how this may change over time, in relation to changes in baseline definitions (and calculation methods), influences the extent to which end-users/consumers (be it households; building (blocks') owners) are affected. And the extent to which value allocation is clear and transparent (and not a black-box) affects the extent to which they are enabled to make an informed decision about accepting and participating in energy optimisation programmes and the extent to which they are enabled to negotiate the conditions of participation.

The following questions about distributional and transparency issues therefore need to be addressed:

- How, are users configured in the current algorithms used to e.g. calculate the baselines for DR?  
What are the expectations about their willingness and ability to participate in or accept the interventions?

- What are the potential distributional impacts of calculation methods and algorithmic approaches and how are these different for different groups of users (and societal groups)? (and what are the risks that e.g. customer segmentation and targeting techniques may at some point even result in the withdrawal of services from 'less profitable customers' in the residential sector? (Crosbie 2016).
- How to ensure that different groups of users are able to understand the value allocation mechanisms so that they are able to judge contracts on their merits, in financial and other terms (e.g. changes in routines/practices) on the short, medium and longer term (e.g. when does their changed behaviour become the new baseline and will they be asked to perform additional changes in order to remain eligible for rewards)?

## SYNERGIES WITH RELATED TASKS

While the DSM TCP Social Licence task addresses how social, organisational and institutional conditions affect successful customer engagement in automated DSM, this task zooms in on the distributional effects of the technologies themselves. As such this task looks at the phase before implementation of (among others) automated DSM by asking how various assumptions about the users, contexts in combination with company ambitions shape technologies and that assesses the extent to which these technologies inherently have socially undesirable distributional impacts. This task therewith will enable an important complementary dimension to the work performed in both the Social Licence Tasks as well as to the work done for the P2P Observatory, and will actively seek synergy through e.g. addressing similar cases of technologies, but with a different approaches and set of research questions. In addition, the findings from this task can be used also to further inform the development of user centered business models in Task 25.

## STRUCTURE OF ACTIVITIES

The envisaged activities listed below need to find synergy with the Social Licence Task as well as the P2P observatory, but also will seek connections to other tasks that focus on smart technology development targeting consumers and prosumers at micro-and meso-levels.

28. **Scope definition:** the type of technologies and socio-technical configurations to focus on: e.g. virtual power plant configurations; local smart grid configurations; DR propositions offered to meso- and micro-level prosumers/users by aggregators; .....
29. **State of the art: review** to assess current state of the art in knowledge, types of pilots and the main challenges to further investigate
30. **Framework and methods for analysis** for international comparative case studies (multi-methods), identification of useful cases and topics, specifying the research questions and methods, templates, training workshops, development of analytical comparative framework etc
31. **Engage with policy makers and other relevant stakeholders to inform the analytical framework and identify policy-related needs**
32. **Conduct, collect, analyse the case-study data**
33. **Assess the main challenges and potential solutions to achieve algorithmic approaches that enable an inclusive, transparent and user-centred energy transition for different types of propositions, contexts and user-groups**
34. **Write and disseminate policy briefs based on each sub-task's domain**
35. **Conduct bi-annual Task meetings in different member countries**, in which findings from different national teams are presented and which support the development of communities of practice (technology developers; market stakeholders; researchers; policy actors etc) in these countries.
36. **Share Outputs** on IEA website, through publications and at conferences.



## WORKPLAN AND SUBTASKS

The approach will include the development of a conceptual framework for the task work, allowing for the participation of various disciplines (both social scientific and technical), across disciplines (active user engagement), in order to create a setting for inter-and transdisciplinary learnings. The aim is to help develop a learning community that is to exist beyond the task which is to take place through the engagement of technical departments of universities as well.

- Theoretical development (informed by science and technology studies; environmental justice literatures; innovation studies; etc) – algorithms and configuration of the users
- Bottom-up inquiry of the settings in which algorithms are developed. The practice of algorithm development and use (e.g. anthropological and ethnographic research, as well as interviews, workshops and other interactive research methods at tech-companies that develop algorithm services to arrive at a better understanding of the assumptions on which the technologies, algorithms and propositions are based.
- Bottom-up inquiry of the settings in which such algorithms are used/implemented to encourage users to change their behaviour or accept changes in e.g. comfort or service. (e.g. anthropological and ethnographic research; citizen panels; focus groups; interviews, workshops and other interactive research methods among diverse user-groups to learn what the needs in relation to the inclusive energy transition, in relation to propositions and other flexibility contracts would be).
- An assessment of how the formal and informal institutional settings at EU level, at national levels and at local levels affect these settings and the legitimacy of the ways in which algorithms are being put to use in these emerging markets, attending to how these arrangements affect transparency, openness and inclusivity.
- Elaborate diverse viewpoints on algorithmic distributional power based on case studies including interviews (in relation to the role of energy, energy systems and need for democratic influence)
- Outcomes – sharing, disseminating, in view of the setting up of a learning community/community of practice
- Stakeholder dialogue sessions – confronting diverging perspectives and seeking common ground for new institutional arrangements
- New innovative transparent algorithms – pilots? Or rather new innovative processes to arrive at algorithms that reflect user needs. To be discussed
- Recommendations: institutional issues and policy advice

## EXPECTED OUTCOMES

- Informed debate and dialogue
- Articulation (mapping) of viewpoints, dilemmas and challenges
- First examples of pilots addressing these issues
- Citizen-based informed inputs for policy
- Institutional mapping and pointing out directions for future work

## HOW TO PARTICIPATE?

To be discussed

We aim for a combination of in-kind resources (largely staff time) to participate and a fee to pay for the operating agent costs.



## POSSIBLE PARTNERS/CASES

cVPP Interreg – community-based virtual power plants  
DR BOB – project partners can be interviewed  
IEA T25 – cases and contacts: ....

## REFERENCES

Tracey Crosbie, « The Utilities in Transition : Gazing through the IT window », Flux 2009/1 (n° 75), p. 16-26.

Saehong, P. et al (2015) Data-Driven Baseline Estimation of Residential Buildings for Demand Response Energies 2015, 8, 10239-10259; [www.mdpi.com/journal/energies](http://www.mdpi.com/journal/energies)

Breukers, S., Crosbie, T. and van Summeren, L. (2019). Mind the gap when implementing technologies intended to reduce or shift energy consumption in blocks-of-buildings. Energy & Environment, Forthcoming.

## STRATEGIC PLAN 2020-2025

### IEA DEMAND SIDE MANAGEMENT<sup>5</sup> TECHNOLOGY COLLABORATION PROGRAMME (DSM TCP) DRAFT STRATEGIC WORK PLAN (2020 – 2025)

## THE TCP'S VISION

To be the world-leading international collaboration platform for policy-relevant socio-technical research on energy use.

## THE TCP'S MISSION

To provide evidence from socio-technical research on energy use to inform policy making for clean energy transitions.

## STRATEGIC CONTEXT

The energy sector is undergoing an unprecedented period of change. Decarbonisation is driving growth of intermittent distributed generation at the grid edge, placing energy in the heart of communities and requiring unprecedented levels of user engagement and demand response. Simultaneously, digitalisation is changing wider social expectations of service, value and usability. These social and environmental forces are turning the energy system inside out, requiring redesigning the energy system around the end user. They are blurring of the boundaries between consumers and producers, across energy vectors, across utilities, and across sectors delivering services to end users.

Improving energy efficiency (energy per unit service) remains critical – but the definition of service shifts to a service-economy model that includes the human dimensions of usability and satisfaction. Poorly designed technologies throughout the supply chain (hardware, software and business models) that are not used as intended, are both energy and economically inefficient. This perspective makes people (designers, intermediaries and end users) as integral as hardware and software to delivering an energy system that meets our wider social, environmental and economic goals. This 'socio-technical' approach sits at the core of the Demand Side Management TCP

Policy makers require these changes to accelerate to improve living standards and meet environmental commitments. This in turn requires both political acceptance and social change at the societal level - as well as technologies being widely adopted and used as intended by companies and individuals.

Delivering this requires understanding the ways in which people and technologies interact within society to support creation of new business models, social innovation and energy transitions to be successful. This is the aim of the Demand Side Management TCP.

## RATIONALE FOR THE TCP'S AND ITS ROLE IN THE ENERGY TECHNOLOGY NETWORK

There is a need for both a better understanding of the nexus between people and energy technologies and a mechanism that brings together technology and non-technical experts. The IEA Energy Technology Network comprises a comprehensive network of technology experts; complementing this

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<sup>5</sup> The title of the TCP is under review and may change prior to submission of the next Request for Extension.

expertise, the TCP provides a home for international networks of social researchers, economists, political scientists and policy makers to work collaboratively on policy-relevant sociotechnical issues relating to energy use.

The TCP has undergone a transition in recent years, moving away from working on traditional demand side management measures and focussing increasingly on the socio-technical aspects of energy use, from behaviour change to business model development. Following a transitional one-year period (2019-2020), the objectives for 2020-2025 confirm this transition and reflect the need for the TCP to develop new networks and build on existing foundations. The TCP will focus on areas where user choices and actions play a large role in determining both the variability and overall level of power and energy use.

## OBJECTIVES FOR 2020-2025

- To establish and develop [four] international networks of expertise to collaborate on the socio-technical aspects of clean energy use.
- To provide impartial and reliable research, guidelines and recommended practices to policy/decision makers and implementers based on international evidence.
- To work with other TCPs to provide multi-disciplinary research on key energy transition topics.

## A SET OF ACTIONS

The TCP's Tasks are the delivery mechanisms for our Strategy. The following thematic areas contain both Tasks that the TCP will undertake and topics that are likely to be the focus of future Tasks.

### *Digitalisation and the energy–people nexus*

- Leading global knowledge sharing through the task-shared Global Observatory on Community Self-Consumption and Peer-to-Peer Energy Trading
- Developing a common framework for creating the social licence to operate in automated consumer-centred flexibility markets through the cost-shared Empower Automation Task

### *Behaviour / systems change analysis and application*

- Applying the TCP's "Task 24" Behaviour Changer framework in fuel poor households and small businesses through the cost-shared Hard-to-Reach Energy Consumers Task
- Enabling the sharing of expertise between government behavioural insights practitioners through the Energy-sector Behavioural Insights Platform
- Potentially undertaking new work on systems change, social innovation and energy transitions


### *Business models*

- Fostering the uptake of energy services through comparative analysis and training on successful business models through the cost-shared Business Model Strategies Task
- Potentially undertaking new work with policy makers and Energy Service Company (ESCO) associations to encourage ESCO market development
- Potentially undertaking new work to better understand the conditions for energy efficiency interventions to be rewarded in future energy markets in which performance can be more accurately measured

### *Socio-technical aspects of energy transitions*

- Potentially undertaking new work on the consumer-related aspects of low-carbon heating and the transition away from natural gas, either as a new Task or integrated into other work
- Potentially undertaking new work on energy technology interface design and usability metrics for key end user technologies such as heating and cooling

Developing the TCP's networks of socio-technical expertise will enable us to collaborate on multi-disciplinary projects with other TCPs focussed on technologies. The TCP will look to work with ISGAN on the digitalisation related Tasks and with relevant TCPs on any future projects in the energy transitions category.



The DSM University will build upon the success of the first 50 webinars and continue to provide a valuable dissemination tool for the TCP's Tasks and other members of the TCP's networks. The TCP will focus more on digital media, updating the TCP website, using social media to advertise events and publications, and working with the IEA Secretariat to reach a wider audience. The TCP will take a strategic approach to recruiting new members, focussing on countries and sponsors that could make a significant contribution to Tasks, and identifying new opportunities to collaborate outside of the ideas set out above.

## NEW NAME FOR THE TCP

### **Purpose**

To decide upon a new name for the TCP.

### **Method**

Two facilitated sessions either side of the ExCo dinner, one with observers and operating agents last thing on Day 1 and the second session first thing in the morning on Day 2.

The choice of facilitator is being made by invitation to tender circulated to organisations identified by the TCP's Procurement Sub-committee. At the point of writing, bids have been received and are under evaluation however the choice of facilitator had not been made. However, before the meeting, details of the facilitator and how the sessions will be run will be circulated. The invitation to tender can be found below.

Ahead of the sessions, delegates have submitted key words and some ideas for names. This information will be passed to the facilitator to help them in their planning.

### **Background**

The term Demand Side Management represents neither the current and future portfolio of projects nor the vision set out in the draft strategic plan. The draft strategic plan focuses on the role of people in the energy system throughout the supply chain where the interaction of people and technology significantly impacts on energy use. While the term DSM can be defined in a way that covers a broad range of issues, it is potentially off-putting to new participants - it sounds old-fashioned to some, belonging to a previous era of regulated monopoly utilities in many countries. The term "management" conveys a sense of top-down control that is out of step with modern disaggregated customer-centred energy service markets. The term "demand side" could also be argued to be outdated, given the blurring of the boundary between those who demand and supply energy. A relaunch with a new name would also mark a break with the past, signalling a new era for the TCP.

# SPECIFICATION – New name for the DSM TCP

## 1. Introduction and Background

- The Demand Side Management Technology Collaboration Programme (DSM TCP) is an international research programme which focuses on policy-relevant socio-technical research on energy use. It aims to provide evidence on the social acceptance and usability of clean energy technologies to policy makers to support clean energy transitions. Further information on the DSM TCP, and on its current branding and visual identity can be found here: <http://www.ieadsm.org/>
- Immediate future work is likely to include projects on peer-to-peer energy trading, the social license to automate consumer technology responses to price signals, energy service business models and two projects on behavior and energy use.
- The TCP has 16 member countries and 3 sponsors across four continents. Each member country and sponsor is represented on the TCP's Executive Committee (ExCo), which makes decisions on the TCP's work programme.
- The TCP has been in existence since 1993 and sits under the auspices of the International Energy Agency (IEA) as one of around 40 TCPs working across the energy spectrum. Together, the TCPs are known as the Energy Technology Network.
- In August 2019, the TCP will be applying to the IEA for an extension to its term from March 2020 to February 2025. The TCP has one (physical) ExCo meeting (in April 2019) before the request for extension is due.
- The current name of the TCP may not be fit for purpose. Energy systems are undergoing transitions, driven by renewable technologies, digitalisation and data analytics, in which concepts of supply and demand are blurred. Future energy systems will have consumers at their heart, potentially making the concept of demand management outdated.
- The challenge now is to develop new name for the TCP that will capture the focus of the TCP's work, create a shortcut to the TCP's brand in the minds of stakeholders, be acceptable to all existing members and appeal to potential new member countries and sponsors.

## 2. Scope

DSM TCP needs to work with a branding expert to create a motivating and compelling new identity for the research programme.

The expert needs to work within the constraints facing the TCP. The name should be acceptable to all current members and will be put to a vote of the ExCo at which

unanimity is required. In addition, the new name should “work” both with and without the inclusion of the term TCP.

We need:

1. A branding and facilitation expert to prepare and facilitate a session at the TCP’s next ExCo meeting on April 4<sup>th</sup>-5<sup>th</sup> in Bern, Switzerland at which consensus on a new name will be sought.
2. Preparation for the session will include analysis of key words and suggestions for new names provided by ExCo members. The key words and suggested names should not constrain development of new ideas.

### 3. Deliverables and Performance Measures

For the written quote, we do not expect bidders to suggest a new name, rather:

- Demonstrate an understanding of the challenges
- Show how they have worked with similar organisations in the past
- Demonstrate the process to be followed and the expertise involved
- Outline budget

Deliverables for the winning agency will be:

- Preparation for and facilitation of a session at the ExCo meeting on April 5<sup>th</sup> 2019 in Bern, Switzerland
- Short report (no more than 4 pages) within one week of the meeting, documenting the session, including the

Proposals will be judged on the following criteria:

- Understanding of the TCP, its purpose, stakeholders and remit
- Pragmatic development of a name that can be used internationally
- Suggested budget
- Branding and facilitation expertise

### 4. Key Dates

Deliverable	Date
Confirmation of interest	1 <sup>st</sup> March 2019
Receipt of written proposal	11 <sup>th</sup> March 2019 (noon)
Bidders informed of decision	15 <sup>th</sup> March 2019
Presentation of proposal (venue tbc – possibly via videoconference). Agree approach.	18 <sup>th</sup> March 2019 (tbc)
Facilitation of session in Bern	5 <sup>th</sup> April
Completion of deliverables and contract	12 <sup>th</sup> April 2019

### 5. Contract Management Arrangements

Professor David Shipworth (University College, London) is the TCP’s Chair and representative responsible for managing the contract with the winning bidder. The decision will be made by the Contractor Steering Committee of the TCP. Separate contract documentation will be issued.



## 6. FEATURE TABLES

<b>A. Essential Features</b>	
A supplier who cannot match these features is unlikely to be awarded the contract	
<b>A1.</b>	<i>Strategic thinking and understanding of the challenges. Application of this thinking to creative concept options.</i>
<b>A2.</b>	Ability to work collaboratively.
<b>A3.</b>	Ability to meet timeline.
<b>A4.</b>	Experience of working with similar organisations (international/academic/non-profit).
<b>A5.</b>	Proven success in brand development.
<b>Additional Comments</b>	

<b>B. Additional Information</b>	
<i>Additional information is required regarding the following (facts &amp; data required that do not fall into the previous categories)</i>	
This information may result in modification of the evaluation scores	
	<b>Additional Information Requirement</b>
<b>B1</b>	Financial stability of the organisation.
<b>B2</b>	Sustainability policy.
<b>B3</b>	Team information.

DOCUMENT N

## **DSM TCP EXCO STEERING COMMITTEE REPORT**

During the past six months numerous conference calls have been held (every fortnight excluding holidays and ExCo Telephone conference weeks).

Discussion topics have been:

### **ANNUAL REPORT**

Chairman's report for the Annual report  
Assembled by ESC and submitted 28 January

### **EUWP REPORT**

Assembled by ESC and submitted 13 Feb to Michele de Nigris, EUWP

### **NEWSLETTER**

ESC agreed to suspend the production of the newsletter until discussion on comms at April ExCo meeting

### **COMMUNICATIONS**

Work up discussion points for a review of Communications at the April ExCo meeting

### **OUTREACH**

Good contacts made with IDEA (Spanish Energy Agency), NRCan (Canadian Energy Ministry), ECA (New Zealand Energy Agency) and BMWi (German Energy Ministry)

### **REBRANDING**

Agreed timeline for rebranding following discussion at London ExCo meeting  
Agreed schedule, specification and tender for expert branding facilitator

### **GOVERNANCE**

- Establishment of two new subcommittees. One for Procurement (formally the ExCo Operating Agent subcommittee) and one for Finance.
- Reviewing and rewriting governance documents
- Discussions with IEA Legal around updating Implementing Agreement

### **FINANCE**

- Proposed that the budget should make allowances for additional spending from the common fund for activities related to relaunch

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- Worked with the finance sub-committee to present the financial report 2018 and proposed budget 2019 at the February ExCo teleconference

## **DSM TCP E-MAIL ADDRESSES**

The ESC agreed that DSM TCP email addresses would be useful for the Secretariat, Chair and others as requested.

## **NEXT EXCO IN BERN**

Agreeing agenda

Writing papers

Securing guest speakers

## OPERATING AGENT REPORT

### Purpose

To update the ExCo on the activities of the ExCo Operating Agent over the three-and-a-half months since he took up duty on 12<sup>th</sup> November 2018 and the end of February 2019.

### Background

On 12<sup>th</sup> November, Samuel Thomas began working as the ExCo Operating Agent, a role that he agreed to take on for one year at a rate of €780 per day, with a ceiling of €50 000 for the year. The proposal, agreed with the contractor sub-committee, set out an indicative split between the main Tasks expected of the Operating Agent. The agreed proposal can be found at the end of this paper.

### Main Tasks

The main Tasks over the period to end-February have been to:

- Assist the ESC in drafting papers on Task guidance, communications, the strategic plan and finance
- Assist the ESC in preparing the Annual Report and EUWP report
- Prepare meeting papers for, attend and minute two ExCo telephone conferences
- Prepare meeting papers for, attend and minute fortnightly ESC telephone conferences (except during holidays and ExCo telco weeks)
- Prepare for, attend and note fortnightly catch ups with Chair
- Outreach to potential new members, existing members and IEA
- Assist in the development of new Tasks
- Assist in the setting up of the finance sub-committee
- Organising and running the tender process for the facilitator role at the Bern ExCo meeting

### Assessment of time allocation

To the end of February Sam had spent 39% of his budget in 30% of the year from Nov 12 2018 to Nov 11 2019. However, during the remainder of the year, Sam will have less time available to devote to the TCP owing to other commitments; by the end of June, he expects to have returned to something close to a balance between time elapsed and budget spent.

The breakdown of Sam's time on DSM TCP duties can be seen in the table below. Sam has spent more time on meeting preparation than envisaged in his proposal.

The table below shows the time spent to date against the initial estimates. For ease of reference the original proposal is provided below this table.

Activity	Account Code	Days	Indicative annual allocation	Notes
Preparing Meetings	6012	3.94	<b>20 (9 days to attend two ExCo meetings; 4 days for ESC; 2 days for Chair meetings; 5 days for prep and follow up)</b>	<b>No physical ExCo meetings yet; have already used up all the budget for meeting prep and follow up (some overlap with other categories)</b>
Participating in meetings	6022	2.31		
Meeting follow-up	6023	1.88		
Annual report	6112	0.88	<b>11</b>	<b>Have not started on the request for extension.</b>
Other IEA reporting	6122	0.81		

Outreach, network	6312	2.75	<b>2</b>	<b>IEA and ExCo members (Spain in particular)</b>
Outreach, new members	6322	2.13	<b>3</b>	<b>Germany and Canada in the main</b>
Task Initiation	6412	3.50	<b>8</b>	<b>Most effort put into trying to move forward with the Behavioural Insights Platform (which has not OA)</b>
Task guidance	6422	0.63	<b>1</b>	
DSM University Content development	6512	1.38	<b>11 in total for external communications: dissemination of information and key messages</b>	<b>Minimal social media activity. Most effort put into curating and securing speakers for the DSMU curriculum.</b>
DSM University Webinar host follow-up	6522	0.81		
DSM University Webinar promotion	6523	0.25		
Web content development	6622	-		
Twitter content	6632	-		
Other support functions	6812	4.00	<b>8 (including updating guidance and organising one-off meetings)</b>	<b>Includes more basic admin functions and general email management as well as the setting up of the finance sub-committee and the branding tender.</b>
<b>Total</b>		<b>25.25</b>	<b>64</b>	

# DSM TCP Interim ExCo Operating Agent Proposal approved by the DSM TCP ExCo

This proposal covers the supply of ExCo operating agent services for one year, from 12<sup>th</sup> November 2018 to 11<sup>th</sup> November 2019.

It focuses on the provision of services that add value appropriate to the level of senior consultant. It suggests some changes to current practice in the TCP.

The estimates of time allocated to the provision of each service may change, however the upper limit of the agreement shall not be breached. The upper limit would amount to €49 920 (64 days @ €780 per 8-hour day).

When conducting business on behalf of the TCP that has been approved by the Chair, travel and accommodation expenses shall be covered by the TCP at cost, subject to Chair and Vice-Chair: Finance approval. The TCP shall also pay for expenses to cover accommodation and non-accommodation costs when attending meetings on behalf of DSM TCP, at a *per diem* rate based on the current [European Commission](#) rates.

Detailed explanations of time estimates are set out in the following pages, including what will not be done by the OA (i.e. by the secretary). The headline breakdown included here:

ExCo, ESC and Chair meeting support	20	31%
<i>ExCo Meeting Preparation</i>	0.5	1%
<i>ExCo Meeting Paper Writing</i>	2	3%
<i>Reporting on role</i>	0.5	1%
<i>ExCo Meeting participation</i>	9	14%
<i>ExCo Meeting Minutes</i>	1	2%
<i>ExCo Teleconferences</i>	1.5	2%
<i>ESC Meetings</i>	4	6%
<i>Chair Catch-ups</i>	2	3%
Communications and guidance updates	33	52%
<i>IEA reporting, including annual report and request for extension</i>	11	17%
<i>International organisation liaison, including with IEA Secretariat</i>	2	3%
<i>New member outreach</i>	3	5%
<i>External communications: dissemination of information and key messages</i>	11	17%
<i>Updating guidance</i>	6	9%
Task initiation	10	16%
<i>Facilitate communications among participants</i>	6.5	10%
<i>Promote Task participation</i>	1.5	2%
<i>Where required, organise one-off meetings, Conferences and Seminars</i>	2	3%
Ongoing Task support	1	2%
Total	64 days	100%

The proposal includes work that was previously undertaken by the advisor (outreach and DSM University, since this is already happening), the Spotlight newsletter editor (from 2019, since the current provider has indicated their preferences to step back from the role) and the secretary to some extent (minute taking and writing-up, given my view that this is an essential task that should be undertaken by the OA).

Additional work could potentially be carried out on a reimbursable basis, as agreed with the ExCo. Given the transition period that the TCP is currently in, the ExCo may feel that this is necessary, especially given that the TCP is likely to procure fewer services from other suppliers in the future.

The final agreed proposal would bind the interim operating agent to fulfil the services as outlined therein. The ExCo Chair would manage the work of the interim operating agent and report back to the ExCo on performance at each ExCo meeting.

## Detailed Breakdown of activities

### 1. ExCo Meeting Support (2 physical meetings during the year)

### **1.1 Assist host country and the ExCo Chair with arrangements and communications for 2 meetings per year**

This service will be split between the OA and the secretary. The role of the OA will be limited to preparing draft agendas for the ExCo meetings, engaging with guest speakers, briefing the Chair on the key elements of the agendas and assisting with the communication of non-administrative issues to the ExCo prior to meetings.

*Time commitment: 0.5 days*

### **1.2 Prepare such papers, discussion documents, presentations etc as requested.**

The OA will prepare ExCo meeting materials to ensure that agenda items are effective in reaching decisions, enable informed discussions and lead to clear action points where appropriate. The OA will include a report on Operating Issues for each ExCo, including details of activities undertaken by the OA.

*Time commitment: 2 days*

### **1.3 Attend ExCo meetings, assist Chair and take minutes**

This is an important role and should be undertaken by the OA. The OA would assist the Chair in keeping the meeting on track and ensure that the key points, decisions and actions are accurately captured, including prompting delegates where appropriate to agree on these points.

*Time commitment: 9 days (including travel to and from, and attending ExCo meetings and DSM Days - assuming one meeting outside Europe)*

### **1.4 Prepare minutes to be distributed to all ExCo members and to the IEA Desk Officer, prepare key decisions/actions list and follow up actions**

This is also important and in my view is a key task to be undertaken by the operating agent. I would propose to streamline the minutes so that they focus only on the key points raised, the decisions and the action points.

I would send round the minutes for agreement and comments within 2 weeks of the end of the meeting and ask that any changes get agreed within that time frame, rather than at the next meeting.

*Time commitment: 1 day*

### **1.5 Lead and minute ExCo teleconferences between meetings (3 teleconferences are foreseen, in December, February and July)**

Prepare agendas and documents for 3 teleconferences (more frequently if necessary) and record and disseminate key points, decisions and actions.

*Time commitment: 1.5 days*

### **1.6 Lead and minute monthly Executive Steering Committee teleconference calls.**

Prepare agendas and documents for monthly calls (more frequently if necessary) and record and disseminate key points, decisions and actions.

*Time commitment: 4 days*

### **1.7 Lead and take forward any actions from fortnightly catch-up calls with the Chair.**

Prepare agendas and take forward actions as directed.

*Time commitment: 2 days*

The secretary would continue to disseminate meeting documents to participants and upload them to the website, as well as maintaining a file of key ExCo documents and correspondence.

# Communications & Co-ordination

## **2.1 Between ExCo and IEA Secretariat, e.g. preparation of TCP Annual Report, IEA documents, End-of-Term Report, Questionnaire and Strategic Plan**

This role would be split between the secretary and OA. The secretary would be responsible for providing administrative information (e.g. finances, membership, meeting information etc.). The OA would coordinate input and maintain editorial control of the preparation of the documents for approval by the ExCo.

*Time commitment: 11 days (more than in an average year given the need to submit a Request for Extension in August 2019).*

## **2.2 Disseminate information between ExCo Chair and ExCo members, e.g. questionnaires, written procedures, etc.**

When decisions need to be made between ExCo meetings, the OA would draft and organise decisions in writing. In practice this is likely to be a relatively small call on the OA's time over the course of the year given the intention to hold ExCo teleconferences between physical meetings.

*Time commitment: None foreseen outside of the time committed for teleconferences.*

## **2.3 With the IEA Secretariat, other IEA TCPs, other international organisations, etc on opportunities for collaboration and dissemination**

Much of this activity will be related to individual Tasks, particularly as they develop. There are likely to be cost-effective opportunities for me to represent the TCP at meetings at the IEA in Paris too, given my location (something that the Chair did in the past).

*Time commitment: 2 days*

## **2.4 Reach out to potential new members and respond to inquiries from third parties**

Much of the proactive reaching out will be related to individual Tasks as they develop: the Tasks will be the attraction to potential new members. However, there will be strategic opportunities to appeal to governments with the whole package. During the year, this activity will evolve.

Initial efforts will be made to engage with Canada, Japan, Germany, Denmark and Saudi Arabia (countries that have already expressed an interest during 2018). Other countries will become potential targets, as directed by the ExCo. Activities include emailing and phone calls and setting up calls with the Chair.

*Time commitment: 3 days*

## **2.5 Prepare a draft communication (dissemination) strategy to inform the transition period and undertake the actions therein**

Ongoing activities will include designing a programme of webinars for the DSM University and securing presenters; managing the TCP's Twitter account; and editing a new reduced-form version of the Spotlight Newsletter – turning it into a series of links with short abstracts.

Preparing for the relaunch in spring 2020 as directed by the ExCo, for example by investigating options for a physical launch and options for updating the TCP's website.

To undertake the OA role, I would like to create a DSM TCP email address.

*Time commitment: 11 days - DSM University (2 days); quarterly newsletters (1.5 days); Twitter account (2 days); comms strategy (3 days); preparing for launch (2.5 days).*

## **2.6 Complete process of updating guidance documents and disseminate and apply new procedures**

This is an activity particular to the first six months of the year. The updating of guidance documents has begun during the review period and will continue through to the April 2019 ExCo meeting.

The OA will draft new guidance on Task initiation, Task reporting, ExCo delegates' obligations, finance reporting and invoicing and complaints procedures, liaising the IEA Legal and setting up procedures to



ensure that the ExCo is engaged in the update process (e.g. through sub-committees and ExCo teleconferences).

*Time commitment: 6 days.*

The secretary would continue to manage the website content and would distribute the newsletter and promotional material for the DSM University. She would also liaise with the IEA to complete the administrative processes associated with changes in membership, including Country National Participation Plan.

## **Initiation of Tasks (more important in this particular year)**

### **3.1 Facilitate communications among participants.**

Initiate and (sometimes) participate in conference calls among participants and potential participants. Assist participants in searching for potential Operating Agents and bringing concept notes and full proposals to the ExCo.

*Time commitment: 6.5 days*

### **3.2 Promote Task participation.**

Encourage participation amongst TCP members to gain the largest possible number of participants in each Task. Reach out to potential new members through engagement with new Tasks at expert level.

*Time commitment: 1.5 days*

### **3.3 Where required, organise one-off meetings, Conferences and Seminars**

This service would be split between the secretary and the OA. The OA role would be limited to helping participants identify suitable events and organisations to work with and reach out to potential participants. The secretary would help with the organisational logistics.

*Time commitment: 2 days*

The secretary would continue to liaise with the IEA Legal Office to complete the administrative aspects of setting up Tasks and registering participants, including the Legal Text for the Task, Country National Participation Plans etc.

## **Support to Tasks when established (minimal during this particular year)**

### **4.1 On-going promotion of Annex participation & awareness.**

Facilitate dissemination of key messages and reports through the TCP's communication channels. Proactively identify opportunities for Tasks to expand membership or disseminate work through other means.

*Time commitment: None (part of communications activity)*

### **4.2 Advise the Task OAs on IEA/IA procedures (e.g. Progress, Annual and Final Reports).**

This activity would be split between the secretary and the OA. The secretary would manage the administrative aspects; the OA would review submissions to ensure that they are fit for tabling at ExCo meetings, proposing changes to documents if agreed by the ESC.

*Time commitment: 1 day (this will be more onerous in future periods once Tasks are in place).*

### **4.3 Initiate and minute regular meetings amongst OAs to unearth issues and explore the potential for co-operation and co-ordination**

These meetings would take place alongside the ExCo meetings.



*Time commitment: None (part of ExCo meeting commitment).*

# COMMUNICATIONS STRATEGY

## Visibility Report / Communications Strategy Issues Paper: March 2020 - February 2025 and transition period (next 11 months)

### Purpose of agenda item

To discuss the TCP's future communications strategy; consider the objectives, focus and target audience of each form of communication; and agree on actions around the various forms of communications including the DSM brand, the DSM University, the newsletter and social media.

### Background

The relaunch of the DSM TCP in 2020, potentially with a new name, means that certain aspects of the TCP's communications strategy will need to change. Other elements of the way in which the TCP disseminates information to stakeholders, shares knowledge between participants and presents itself to the world are also worth debating in the spirit of the renewal of the TCP.

### Visual Identity

**Objective:** Visible elements of the TCP's brand, such as logo, colour, form, and shape, which encapsulate and convey the spirit and ethos of the DSM TCP.

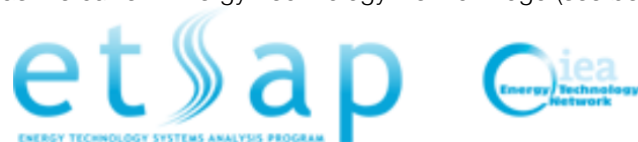
**Target market:** All stakeholders.

**Current reach:** Difficult to know without carrying out a survey.

**Focus of discussion:** Encapsulating the TCP name; Link to the IEA; timing of work.

If the TCP changes its name, this would necessitate a new visual identity. The logo in particular should aim to leverage the IEA brand while adhering to the guidelines issued by the IEA Secretariat. In order to relaunch in the first half of 2020, any new visual identity would need to be developed as soon as the TCP has confirmation of an extension to its mandate.

The IEA have indicated that TCPs should not include the term "IEA" in their names, or any new logos developed by TCPs. The IEA are also developing a new logo for the Energy Technology Network, which will most likely include the term "Technology Collaboration Programme" – the IEA would like to promote this term. The IEA's new proposals are likely to be ready by June, in time for the All TCP Meeting in Paris. In developing a new visual identity, the DSM TCP might consider a logo that could incorporate the new IEA TCPs logo. An example of this approach can be seen in the current ETSAP TCP logo, which uses the same colour scheme as the current Energy Technology Network logo (see below).



Document templates (Word, PowerPoint etc.) would need to change as part of a new visual identity. The current Word template is not very user-friendly.

If a new visual identity is developed, work would need to begin immediately after the confirmation from IEA's Committee on Energy Research and Technology (CERT) on the extension of the TCP's mandate in October 2019. Preparatory work would need to be undertaken beforehand following feedback from the IEA's End-use Working Party (EUWP) meeting in September 2019.

If a new visual identity is developed, the website would also need to change. The development of the look of the website could be developed in tandem with the visual identity, i.e. in Q4 2019.

### Website

**Objectives:** To communicate the valuable work of the TCP in an easily accessible form.

This includes providing easy search and access routes to the TCP's outputs, information on how to join the TCP and attend upcoming events; promotion of the TCP and its outputs; and allowing participants (ExCo members and Task experts) to collaborate in a secure online environment.

**Target market:** Policy makers; potential participants; current TCP participants; researchers.

**Current reach:** The website visibility report reflects the reduction in reporting output from the TCP (see visibility report below).

**Focus of discussion:** Views on the current website; desired functionality; security.

### Visibility report

Website traffic from September 1 2018 to 28 Feb 2019

- 4,306 Sessions, averaging 23.8 hits per day (down 7% on previous 6 months)
- 3,080 unique users (down 4%)
- Average time spent on site: 02:09 (down 12%)
- 70% New visitors

User Engagement By Country, top 25:

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Duration	Downloads
United States	679	86.45%	587	81.74%	1.47	0:00:45	3
Sweden	305	17.70%	54	43.28%	2.97	0:04:22	21
France	282	58.16%	164	59.93%	2.31	0:02:14	17
United Kingdom	278	67.99%	189	58.99%	2.46	0:02:26	4
Netherlands	157	61.78%	97	50.32%	2.7	0:02:19	2
India	150	86.00%	129	73.33%	1.61	0:01:19	8
China	141	82.98%	117	83.69%	1.81	0:01:18	0
Italy	134	67.91%	91	61.19%	2.65	0:02:56	4
South Korea	132	88.64%	117	77.27%	2.68	0:01:15	11
Ireland	131	80.15%	105	61.83%	2.14	0:01:50	17
Iran	124	45.97%	57	42.74%	3.98	0:05:19	7
Germany	116	80.17%	93	65.52%	2.81	0:02:44	3
Indonesia	114	97.37%	111	90.35%	1.19	0:00:23	2
Spain	106	66.04%	70	57.55%	2.4	0:03:44	11
Canada	101	67.33%	68	62.38%	2.31	0:01:29	5
Australia	93	80.65%	75	63.44%	2.24	0:02:02	2
Brazil	83	53.01%	44	84.34%	1.8	0:02:09	0
Switzerland	81	65.43%	53	64.20%	1.96	0:01:32	3
Austria	73	49.32%	36	54.79%	2.99	0:02:43	6
Belgium	71	74.65%	53	50.70%	2.79	0:02:33	0
Japan	64	79.69%	51	70.31%	1.92	0:01:02	2
New Zealand	63	46.03%	29	52.38%	2.6	0:02:18	3
Norway	59	45.76%	27	49.15%	3.05	0:04:13	5
Russia	50	98.00%	49	78.00%	1.22	0:02:00	0

<b>Finland</b>	<b>40</b>	<b>72.50%</b>	<b>29</b>	<b>52.50%</b>	<b>2.4</b>	<b>0:01:53</b>	<b>8</b>
<b>Totals</b>	<b>4,306</b>	<b>70.13%</b>	<b>3,020</b>	<b>65.35%</b>	<b>2.27</b>	<b>0:02:09</b>	<b>173</b>

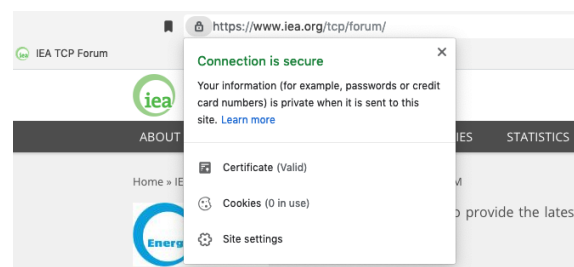
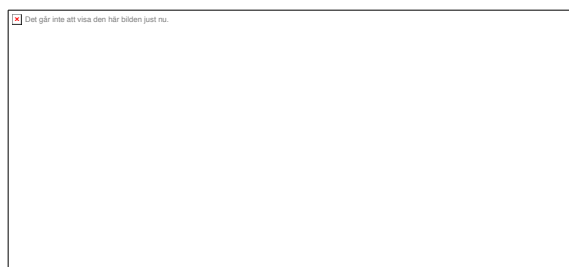
Engagement from South Korean users has dropped off (in the previous 6 months South Korea topped the list for the most amount of time on the site). Iranian, Swedish and Norwegian visitors now spend the most time using the site. The United States continues to bring in more new users than other countries.

Report Downloads have dropped off significantly compared to last year, with 173 downloads compared to 352. This is unsurprising given that the majority of previously tasks have concluded.

Top Topics for downloads

Topic	Downloads
Task 25	26
EGRD	18
Task 24	17
Participation	17
Dublin Workshop	17
Task 13	15
Task 17	13
Seoul Workshop 2007	13
Legal Text	9
Task 16	8

The current website does not provide easy access to information on Tasks. The information is not organised in an intuitive or consistent manner. Improving this element of the website could be done without the need for a new website. The members-only parts of the website could enable better member communication and result in less email traffic. Rather than distributing papers via email, links could be sent to ExCo delegates. A new website could provide more functionality and include an ExCo SharePoint site, where ESC, finance sub-committee and other sub-committee meeting papers could be shared and developed by participants. Each of the TCPs Tasks could also have their own sections of the website with their own SharePoint sites with access limited to Task participants. An example of this approach can be seen in the [4E TCP website](#). For the members-only part of the website, the extent to which Task participants may wish to use it to collaborate should be considered, with other options, such as [Slack](#), being potential alternatives for Task collaboration. The security of the members-only parts of the website also needs to be improved (see below the contrast between the ieadsm.org domain and the iea.org domain). The website as it currently stands is unsuitable for storage of personal or financial data such as that contained in invoices, so will need to be reviewed if we intend to use it for such purposes. For any review of the website we should stipulate at least minimum industry standard security protocols on the ExCo members area (e.g. https:// using security certificates from trusted organizations).



**Decision:** The ExCo is invited to agree to the development of invitation(s) to tender for a new visual identity and website contingent upon the feedback from the EUWP being positive with respect to

**the request for extension of the TCP's mandate from 2020. Tenders could be invited for both elements together or for just one of the elements in order to ensure that we have the potential to access the widest set of skills.**

## **Publications**

**Objective:** To influence policy makers and other relevant targeted participants.

**Target market:** Policy makers; policy implementers; market participants; researchers and potential future TCP participants.

**Current reach:** Downloads from the website are down (see above). The IEA Secretariat has provided the opportunity for the TCP to promote two future Tasks in the upcoming Energy Efficiency 2019 publication.

**Focus of discussion:** Policy relevance of output; collaboration with the IEA and other TCPs.

Recent key publications:

- Annual Report 2018 [http://www.ieadsm.org/wp/files/Annual\\_Report\\_2018.pdf](http://www.ieadsm.org/wp/files/Annual_Report_2018.pdf)
- Task 16 - Office Building Deep Energy Retrofit: Life Cycle Cost Benefit Analyses Using Cash Flow Analysis and Multiple Benefits on Project Level; Springer, <https://doi.org/10.1007/s12053-018-9707-8> (July 2018)
- Task 24 – Subtask 10 Ireland Policy Brief (26 September)
- Task 24 – Policy Brief New Zealand (28 September)
- Task 24 – Final Report Ireland (1 October)
- Task 24 – Policy Brief Sweden (1 October)
- Task 24 Final Report Sweden (1 October)
- Task 24 Subtask 9 – Beyond kWh evaluation tool Ireland (1 October)
- Task 24 Subtask 8 – Toolbox for Behaviour Changers (8 October)
- Task 24 – FINAL REPORT New Zealand (31 January)
- Task 24 Subtask 9 – S. Rotmann and D. Chapman (2018). Evaluating Energy Saving Kit Impacts – Are they educating and empowering end users to change behaviors? A Cross-Country Case Study Comparison. BECC Conference, Washington D.C., (October 2018).
- Task 24 Subtask 11 – K. Cowan, R. Sussman, S. Rotmann and E. Mazzi (2018). It's Not my Job: Changing Behavior and Culture in a Healthcare Setting to Save Energy. ACEEE Summer Study Monterey, US.

The TCP's reports and academic publications are some of the central outputs of its Tasks. In order to ensure that the messages reach their intended audiences (normally, although not always, policy makers), Tasks have often produced Policy Briefs. These concise documents bring out the policy-relevant aspects of the research and point to where further information can be found. The ExCo could do more to insist upon the production of policy briefs (or their equivalents) and to review them to ensure their quality.

Partnering with the IEA Secretariat to co-author reports enables the TCP to leverage the IEA brand and reach a broader audience. In 2019, the "Social Licence to Automate" and "Peer to Peer" Tasks will be producing material for the Energy Efficiency 2019 IEA publication, which will focus on digitalisation and its link with energy efficiency. Further opportunities for this type of collaboration should be sought.

The EUWP, in reviewing the TCP's effectiveness, uses both of these metrics (number of policy briefs; collaboration with the IEA Secretariat and other TCPs).

## **Events**

**Objective:** To influence policy makers; build network for potential future collaboration.

**Target market:** Policy makers; policy implementers; market participants; potential future TCP participants.

**Current reach:** The TCP Chair has been invited to speak at a number of IEA events, including the Buildings Coordination Group, the EUWP; Task Operating Agents have also presented at IEA events in recent years, reflecting the policy-focus of much of the TCP's work. Task OAs have also presented at high-profile conferences such as BEHAVE and BECC.

**Focus of discussion:** Whether the TCP should focus on organising more high profile events itself.

Collaboration with the IEA Secretariat and other TCPs is also something that the EUWP promotes.

Participating in IEA conference, workshops and meetings can help to build relationships with the IEA Secretariat and potential TCP participants. Similarly, presenting at internationally renowned conferences (such as BEHAVE, BECC and BX in the behaviour field) can lead to greater participation in Tasks, as well as helping in the process of peer review of the TCPs work.

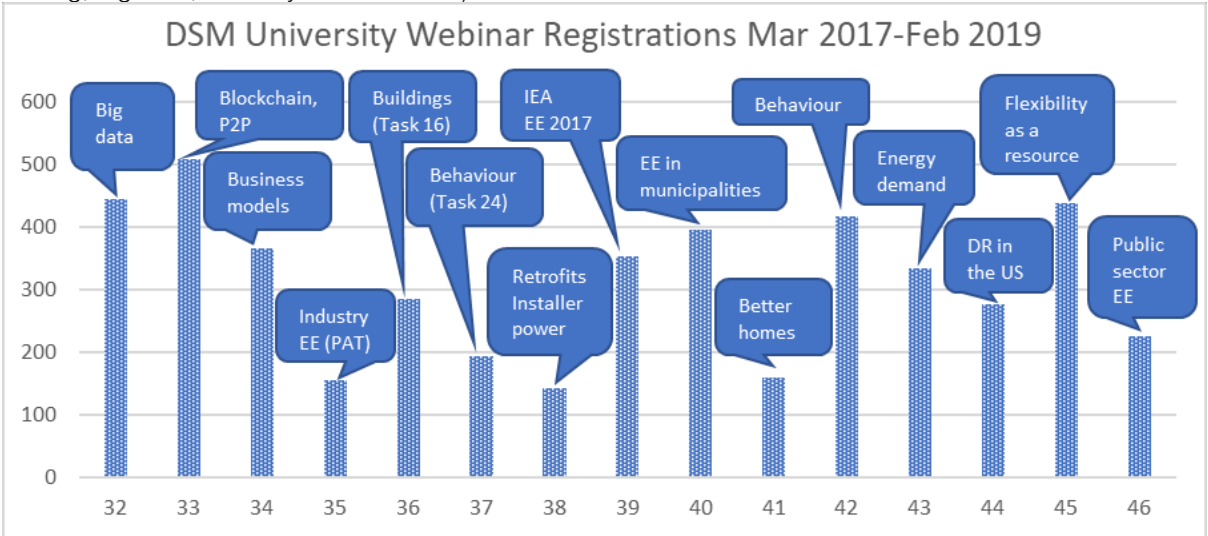
One option worth discussing would be to build upon the TCP’s current ExCo meeting and DSM Day format, by scheduling more Task meeting during the same week and turning the DSM Day into a more high-profile international conference. Such an approach would be most applicable where the host country is participating in a wide range of Tasks; in this circumstance, Task meetings would have been scheduled in the host country in any case.

**DSM University**

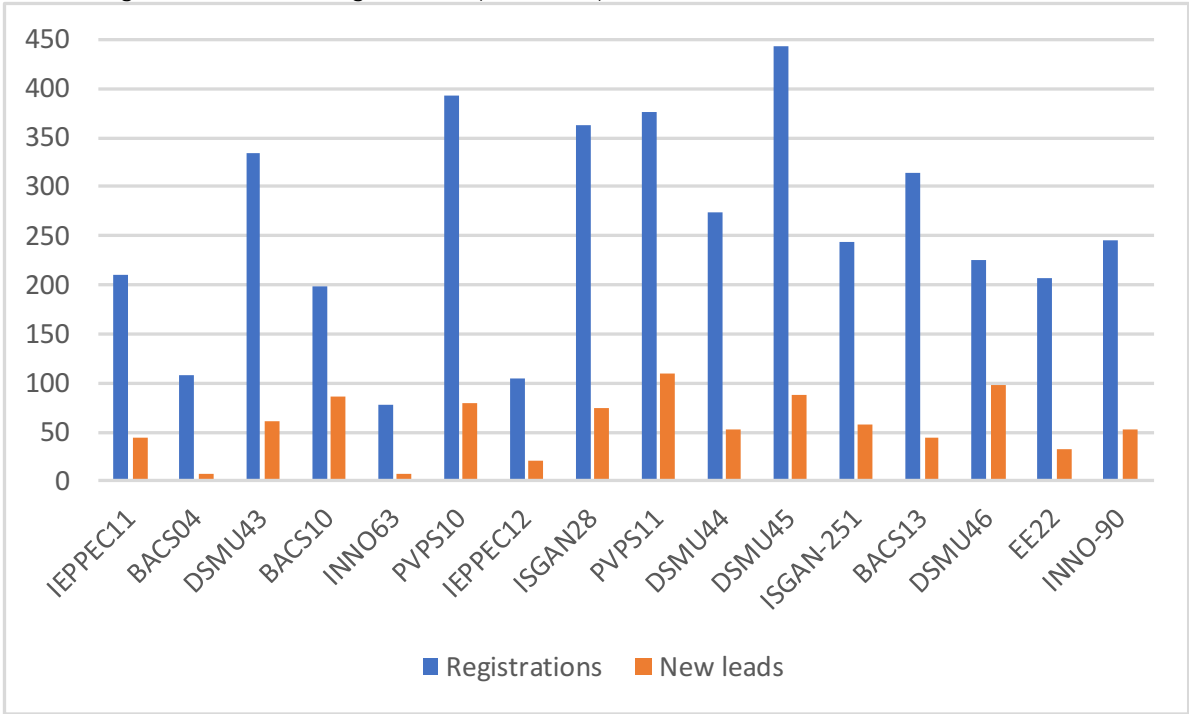
**Objective:** To influence policy makers and other relevant targets.  
**Target market:** Policy makers; policy implementers; market participants; potential future TCP participants.  
**Current reach:** Webinar registrations number between 200 and 500.

**Focus of discussion:** Possible changes to the curriculum; getting broader input across member countries. In their feedback on the TCP’s request for extension last year, CERT requested that the TCP continue to support the DSMU, which they consider to be a strong offering. If the TCP changes its name, a decision will need to be made on whether the DSMU also changes its name.

Webinar registrations have continued at similar levels to earlier periods (200-500) since the resumption of the programme with DSMU 42 in October 2018 (see below). Over the course of the last four years, the most popular topics have been those focussed on digitalisation-related topics (Blockchain/peer-to-peer energy trading; big data; flexibility as a resource).

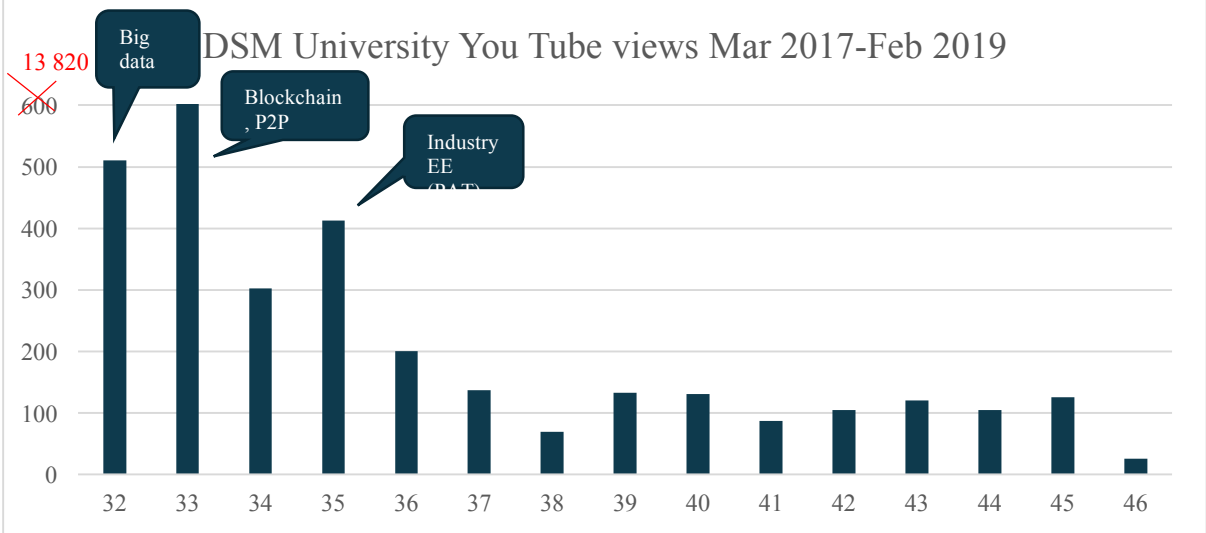


Compared to other webinars using the Leonardo Academy platform, the DSM webinars are amongst those with the highest numbers of registrations (see below).



DSM University You Tube views accumulate over time with the most recent additions the most likely to gain new views. Most of the webinars over the last year have attracted 100 or more views and, of the webinars posted during the last two years, only those on big data, peer-to-peer and the Perform, Achieve, Trade (PAT) programme in India have reached more viewers than those registered for the original webinar. By far the most viewed webinar is the David's peer-to-peer presentation, with 13 820 views (see below).

Currently, the webinars are a mixture of presentations from Tasks and presentations from peers working in the field, identified by the ExCo Operating Agent / Advisor. This has worked well in terms of generating interesting presentations but has not led to a structured offer that could be said to be equivalent to a university course. Designing the DSMU curriculum in a more structured way would require more resources than are currently made available to it.



**Action:** Assuming that the curriculum continues to be designed in its current way, ExCo members are requested to suggest potential webinars from projects / thought leaders in their own countries to feature in the webinar series.

**Newsletter**

**Objective:** To influence policy makers and other relevant targets.

**Target market:** Email distribution list (policy makers; policy implementers; market participants).

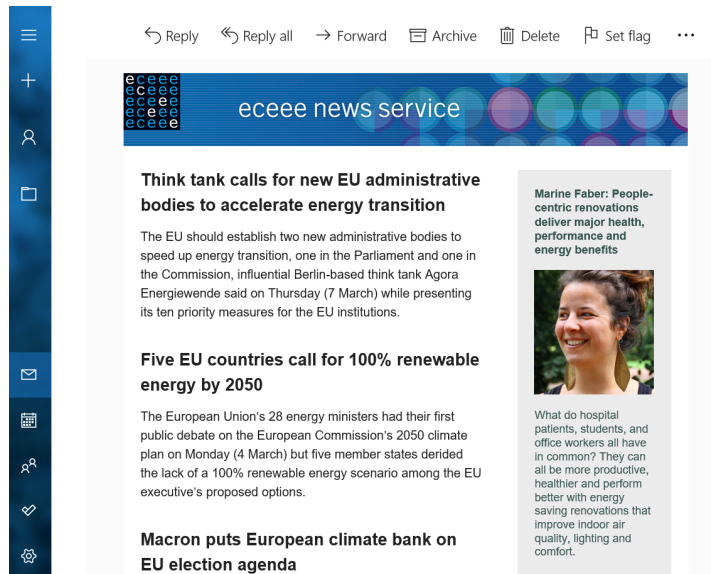
**Current reach:** 2357 in DSM TCP data base at present.

**Focus of discussion:** Format, content and frequency of future newsletters.

Following the decision by the former editor of the Spotlight Newsletter to no longer provide services to the TCP, the ESC suspended the production of the Newsletter in its current format. The decision was taken in light of the discussion at the last ExCo, where some delegates felt that a different format could deliver the dissemination services needed at lower cost. In addition, with only one active Task, the Newsletter was not a priority.

In future the costs of the Newsletter could be lower, and its readability improved, by moving to a simpler email format with short descriptions of articles and links to the website. The first such newsletter could be produced following the Bern ExCo meeting and feature articles on the TCP's Tasks and Task proposals. An example of this approach is taken by ECEEE (see below).





**Decision:** The ExCo is invited to agree to the production of an email newsletter on a six-monthly basis, with the option to move to quarterly once more Tasks are operational.

### Social Media (Twitter)

**Objective:** To draw attention to the TCP's outputs and events.

**Target market:** Twitter followers (policy makers; policy implementers; market participants).

**Current reach:** 648 Twitter follower; 207 Facebook member; 142 on SlideShare

**Focus of discussion:** Organisation of the DSM Twitter account and individual Task accounts.

The Twitter account has been very active under the management of the former Task 24 Operating Agent, Sea Rotmann. The ExCo Secretariat (Anne Bengtson and Sam Thomas) also have access and Tweet less frequently. Views are sought from delegates on how to manage the Twitter account in future. One option would be for each Task to have its own Twitter feed and for the ExCo Secretariat to retweet key Tweets along with others on DSMU webinars and other cross-TCP issues. Active Twitter users on the ExCo are encouraged to retweet DSM messages and the ExCo Operating Agent can take advantage of his connections at the IEA to encourage the IEA to retweet the most important DSM tweets. We should also seek to have member organisations tweet from their organisational account.

## UPDATED TASK GUIDANCE

### **Purpose of agenda item**

To discuss potential new guidance for DSM TCP Tasks, using the draft below as the basis for discussion.

### **Background**

ExCo members, prospective operating agents and other potential participants need to understand the nature of international collaboration through the TCP's Tasks. The guidance is intended to be a high-level overview of how to collaborate and to be complimentary to the TCP's legal text (the Implementing Agreement).

The draft is not comprehensive, focussing on the aspects of most concern to ExCo members and Task participants. Other types of information contained in the TCP's current guidance ([PPG Full Version June 2008.pdf](#)), such as format of documents, processes for engaging with the IEA Secretariat etc., are more relevant to the operational role of the Operating Agent and Secretary, and would provide a distraction from the main purpose of this note – moving towards agreement on new guidance around Task initiation and management.

The paper is part of an iterative process: it will both help to inform the updating of the Implementing Agreement, draw on the updated legal text and reflect developments in the initiation of new Tasks over the coming months.

ExCo members are asked for their views on the draft updated guidance. Is it clear and does it cover the issues of concern? How could it be improved?

# DSM TCP Task Guidelines

These guidelines are intended to provide general guidance for the operational management of DSM TCP Tasks to ensure transparency and efficiency in daily operations. They do not replace the formal rules adopted in the DSM TCP Implementing Agreement (IA); instead, they complement the IA and subsequent decisions by the DSM TCP ExCo.

The guidelines have been developed to assist ExCo delegates, Task lead countries, participants and Operating Agents by providing practices and procedures to deliver on the goals of transparency and efficiency. Exceptions to the arrangements in this document may be made by agreement between the ExCo Chair and lead countries of all operational Tasks and reported to the ExCo.

## Cost-shared and task-shared distinction

- 1.1 Cost-shared Tasks involve the pooling of funds by Task participants. Funds are used to pay for an Operating Agent to manage the Task and sometimes for subtask leaders and for the provision of other goods and services useful to the Task. Those receiving pooled funds for the provision of goods and services shall not be members of the DSM TCP ExCo. **[Note: Do ExCo delegates feel that this is too prescriptive? It is an attempt to deal with the issue of real and perceived conflicts of interest].**
- 1.2 Task-shared Tasks do not involve the pooling of funds to pay for an Operating Agent. The Operating Agent is supplied by one of the participating countries. Subtask leaders are also provided by participating countries. Participants' funds are sometimes used to pay for specific items useful to the Task.
- 1.3 In both types of Tasks, participants need to commit resources (usually the time of participating Experts) to ensure the success of the Task. Each Task participant shall gain agreement from their ExCo delegate to participate and write to them, setting out the nature of their commitment to the Task, including the amount of time they will allocate to working on the Task.
- 1.4 The initiation process is the same for both types of Tasks. The management procedures are different, owing to the financial aspects of cost-shared Tasks.

## Initiating or renewing DSM TCP Tasks

### Procedure

The process for initiating a Task, or renewing an existing Task, is that a clearly identified **lead country** should:

- 1.5 **Prepare a Task Concept Note.** The Concept Note is presented to the ExCo by the ExCo delegate of the lead country, supported by the prospective Operating Agent, if one has already been identified.
- 1.6 **Secure support** of a minimum of two member countries willing to develop the concept into a full proposal. Securing support from more countries is advised to increase the likelihood of success when presenting the full proposal to the ExCo. **[Note: please give some thought to this issue. Is two sufficient as the minimum?]**

- 1.7 **Convene an international meeting** of prospective participants in the Task ahead of submitting a full proposal to the ExCo.
- 1.8 **Secure the support of enough other countries to make the Task viable.** At a minimum, two member countries must agree to create a new Task with an agreed work plan and budget. In normal circumstances Tasks should strive to engage all members and have a critical mass of members because it meets the DSM TCP strategic objectives.
- 1.9 **Gain Task approval** from the ExCo.
- 1.10 Applications for ExCo approval should be made to the ExCo as far in advance of meeting dates as possible, and not later than 30 days prior to the ExCo.

#### **CONTENTS OF PROPOSALS FOR NEW WORK**

The document that will propose the new work to the Executive Committee should include:

1. Background and motivation
  2. Objectives
  3. Issues for the new work (scope)
  4. Structure (sub-tasks)
  5. Management (the Task Operating Manual setting out the management processes and the responsibilities of the Operating Agent, Subtask leaders and Experts)
  6. Deliverables (for whom, target groups)
  7. Time Schedule and milestones
  8. Commitments (Resources needed)
  9. Meetings plan
  10. Information activities
  11. Co-operation with other TCPs, the IEA Secretariat and other interested parties
- Annexes: Detailed description of Subtasks

#### **Task approval criteria**

The following criteria may be used by the ExCo to approve a Task application or renewal.

- 1.11 The extent that a proposal demonstrates:
- **Well-defined** objectives and **realistic** deliverables **best met through international collaboration.**
  - A Work Plan that **aligns with the DSM TCP Strategic Plan and demonstrates pathways to impact.**
  - Activities that **do not duplicate** those currently undertaken by another organisation or could be better achieved by another organisation.
  - The **commitment** of the lead country and other participating countries in delivering the Work Plan.
- 1.12 Potential Tasks may have other unique attributes, and these should be addressed in any proposal.
- 1.13 Tasks do not require all contracting parties to participate in Task activities, but Task proposals must receive **unanimous approval** from the ExCo. Unanimous approval includes votes in support and abstentions.

## Cost-shared Task Management

- 1.14 Each Task, under the management of the lead country (who shall be appointed by the majority vote of the Task participants), shall decide on issues of membership, financial contributions and the day-to-day running of the Task within the broad framework agreed by the ExCo and the Implementing Agreement.
- 1.15 The organisational procedures, presented as part of the Task proposal, shall become part of the Task legal text when adopted.
- 1.16 In-kind contributions should only be accepted in lieu of financial support where they are for the express purpose of achieving the aims and objectives of Tasks or to support Task activities.
- 1.17 Activities associated with projects which are not under the direct management of the Task should not be considered as in-kind support, although they may be identified as an “Associated Project” that is beneficial to the Task.
- 1.18 Generally, in-kind support should not include the time and expenses of participating in management activities by Task members. Participants in each Task should decide on the types of in-kind contributions allowed and the method of valuation and accounting of in-kind contributions.
- 1.19 The Operating Agent of any Task must inform the ExCo Chair when a participant remains in default of financial obligations for more than 12 months or two ExCo meetings (whichever is the shorter).
- 1.20 In the event that either financial obligations or other agreed in-kind support is not provided by a participant, the other participants in the Task shall agree on how to reduce the scope of the Task and the Operating Agent’s duties if necessary.
- 1.21 Operational Tasks are to provide a progress report at each ExCo meeting.

## Task-shared Task Management

- 1.22 Each Task, under the management of the lead country (represented by the Operating Agent), shall decide on issues of membership, and the day-to-day running of the Task within the broad framework agreed by the ExCo and the Implementing Agreement.
- 1.23 The organisational procedures, presented as part of the Task proposal, shall become part of the Task legal text when adopted.
- 1.24 Once a Task is operational progress reports should be provided at each ExCo meeting.

## Task Management Issues

- 1.25 Participants in Tasks must be from countries or sponsors participating in the DSM TCP ExCo.

- 1.26 Task participants should [aim to] meet at least twice a year, with at least one meeting taking place in the margins of an ExCo meeting [*Note: this is an option to be discussed – there are pros and cons to this approach: pros – the ExCo can engage with the Task close-up; cons – reports cannot be prepared on the event before the circulation of ExCo meeting papers*].
- 1.27 There should be clear procedures for Task participants to make decisions. A record of decisions adopted by Task members at formal Task meetings shall be kept and made available to Task members as soon as possible and not more than six weeks after the relevant meeting.
- 1.28 Decision making outside of Task meetings should consist of a formal vote by Task members, the result of which is recorded and circulated with the outcome to all Task members.
- 1.29 Participants wishing to join Tasks after they have begun should be allowed to do so providing that all existing participants (and the Operating Agent) agree on the contributions (financial and/or in-kind) required.
- 1.30 Task participants are responsible for ensuring the quality of the outputs of their Tasks and advising the ExCo on the approval of Task reports. [**Note: The ExCo may wish to set up a sub-committee to ensure the production, and control the quality of key publications, such as Policy Briefs**]
- 1.31 Task participants shall conduct a mid-Task review after 18 months (or half way through the Task, whichever is sooner), reporting to the ExCo on its outcomes and addressing any issues quickly.
- 1.32 Task participants shall conduct an end-of-Task review, reporting to the ExCo and making recommendations for future Tasks and changes to this guidance.

## Co-ordination between Tasks

- 1.33 The Operating Agents for every DSM TCP Task and the ExCo Operating Agent will have regular contact comprising at least one teleconference each year.
- 1.34 The purpose of these meetings will be to coordinate activities across the DSM TCP and to raise operational issues for consideration by the ExCo Chair. The outcomes of these meetings will be recorded and provided to the ExCo Chair and Task leaders. Where necessary, matters may be referred to the ExCo for further deliberation.

## Resolution of disputes

- 1.35 Task participants should take up any issue or complaint directly with the relevant Task Operating Agent, also informing the leader of the relevant Task, where applicable. If they remain dissatisfied with the outcome, participants may refer the issue to the ExCo Chair.
- 1.36 Task Operating Agents should take up any issue or complaint directly with the ExCo Operating Agent. If they remain dissatisfied with the outcome, Task Operating Agents may refer the issue to the ExCo Chair.
- 1.37 The ExCo Chair may refer issues to the Task Operating Agents, the ExCo Operating Agent, the ExCo or deal with the matter themselves. If the complainant remains dissatisfied with the outcome, an independent arbitrator may be called upon to resolve the dispute.



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## Executive Committee meetings of the DSM TCP initiative

Meeting #	Date	Country	Participants	Countries on ExCo
interim	1 –2 April, 1993	Stockholm, Sweden	14	14
1	28 – 29 October, 1993	Kerkrade, Netherlands	13	14
2	24 – 25 March, 1994	Madrid, Spain	12	14
3	13 – 14 October, 1994	Washington D.C., USA	14	15
4	23 – 24 March, 1995	Schaffhausen, Switzerland	15	15
5	19 – 20 October, 1995	Fukuoka, Japan	14	15
6	21 – 22 March, 1996	Paris, France	14	15
7	31 Oct – 1 Nov, 1996	Sydney, Australia	12	15
8	10 – 11 April, 1997	Helsinki, Finland	14	15
9	10 – 13 September, 1997	Oslo, Norway	9	15
10	25 – 27 March, 1998	Seoul, Korea	10	15
11	7 – 9 October, 1998	Chester, United Kingdom	12	15
12	14 – 16 April, 1999	Copenhagen, Denmark	12	17
13	28 – 29 October, 1999	Amsterdam, Netherlands	14	17
15	3 – 6 April, 2000	Ankara, Turkey	12	17
16	12 – 13 October, 2000	Athens, Greece	13	17
17	3 – 4 May, 2001	Eskilstuna, Sweden	12	17
18	3 – 5 October, 2001	Barcelona, Spain	13	17
19	18 – 19 April, 2002	Milan, Italy	15	17
20	3 – 4 October, 2002	Graz, Austria	15	17
21	8 – 10 April, 2003	Canberra, Australia	9	17
22	14 – 15 October, 2003	Paris, France	15	17
23	15-16 April 2004	Trondheim, Norway	16	17
24	13-15 October 2004	Atlanta, United States	13	17
25	20-21 April 2005	Saariselkä, Finland	15	17
26	October 2005	Madrid Spain	14	17
27	April 2006	Copenhagen Denmark	14	17
28	October 2006	Maastricht Netherlands	9	17
29	April 2007	Seoul Korea	10	18
30	11-12 October 2007	Brugge Belgium	15	18
31	2-4 April 2008	New Delhi, India	11	19
32	October 2008	Milan Italy	13	19
33	April 2009	Vienna, Austria	11	20
34	September 2009	Chester, UK	11	20
35	April 2010	Paris, France	11	19
36	October 2010	Stockholm, Sweden	9	19
37	April 2011	Washington, USA	8	18
38	2 – 4 November 2011	Jeju Island, Korea	14	18
39	18 - 20 April, 2012	Trondheim-Tromsø, Norway	10	15
40	September 14-16 2012	Espoo, Finland	10	16
41	24 - 26 April, 2013	Utrecht, The Netherlands	11	17
42	16 – 18 October 2013	Lucerne- Rigi, Switzerland	11	17
43	17 – 21 March 2014	Wellington, New Zealand	9	16
44	15-17 October 2014	Graz, Austria	9	16
45	25 – 27 March 2015	Cape Town, South Africa	9	16
46	22 – 23 October, 2015	Halifax, Nova Scotia	9	17
47	17 – 18 March, 2016	Stockholm, Sweden	11	18
48	11 – 12 October, 2016	Brussels, Belgium	11	18
49	11 – 12 May 2017	Dublin, Ireland	13	18
50	5-6 October 2017	The Hague, Netherlands	8	18
51	17-18 April 2018	Bergen, Norway		18
52	1-3 October 2018	London, United Kingdom	14	19
53	3-5 April 2019	Bern, Switzerland		19

### No's of Executive Committee meetings held in each country

Netherlands	5	Australia	2	Japan	1
Sweden	4	Denmark	2	Turkey	1
Norway	4	Italy	2	South Africa	1
France	3	Switzerland	3	Nova Scotia	1
Finland	3	UK	2	Ireland	1
Korea	3	Belgium	2		
Austria	3	Greece	1		
Spain	3	India	1		
USA	3	New Zealand	1		