



IEA Technology Collaboration
Programme on Demand Side
Management Technologies and
Programmes

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

1 – 3 October
London, United Kingdom



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MATTERS FOR THE EXECUTIVE COMMITTEE

Document A (Pages 9 – 12)

Agenda

- ExCo **approval** of the Agenda
- ExCo **approval** of the Minutes from the 51st Executive Committee meeting (distributed earlier)

Document B (Pages 13 – 17)

Contracting for an Operating Agent

- **Discussion and agreement** on whether to contract for an ExCo Operating Agent (OA) to support the Chair and the ESC and, if so, how to specify and contract for the role.
- **Enlistment of volunteers** to form a sub-committee to produce the OA specification and run the selection process, if decision is positive towards recruiting an ExCo OA.
- **Discussion and agreement** on whether to extend Sam Thomas' contract as interim Operating Agent until either the next ExCo meeting **or** appointment of an ExCo OA. If so, then on what terms.

Election of new Chair

- **Discussion and vote** on new Chair.

Document C (Pages 18 – 31)

Task 24: Phase II: Behaviour Change in DS; Helping the Behaviour Changers – Final Management Report

- **Approve** the Final Task Management report (an addendum related to US work will be submitted for approval by end 2018).

TASK 16 Competitive Energy Services - Final Management Report

- **Approve** Final Management Report

Document D (Pages 32 – 39)

Task 25: Business Model Strategies for a More Effective Market Uptake of Energy Services for and by SMEs and Communities

- **Approval** of later end-date for Phase 2 considering the delays in contract finalisation. Our proposal is to allow for the Task to run until the ExCo in fall of 2020 instead of the ExCo spring of 2020. Against no additional cost for participating countries.
- **Discussion** on improving the (interface of the) website. It is proving very difficult to get reports etc. online on the website, there are multiple bugs in the system.
- **Approve** the Task Status Report

DOCUMENT E (Pages 40 – 41)
Options for Structuring Future Tasks

- **Discussion and agreement** to enable different task structures to be used for new Tasks.

Document F (Pages 42 – 43)
Empowering Automation (Concept Note)

- **Consideration** of the rationale, aims and objectives of this research proposal
- **Expressions of interest from countries in participating;** over the summer two teleconferences have been held between interested parties: Australia, Belgium and Ireland (with Netherlands and UK also involved). Delegates are asked to consider which organisations (e.g. network companies; regulators; academics) would benefit from the work in their countries
- **Approval** to progress this project to a full proposal for the next Executive Committee meeting through collaboration between interested parties

Document G (Pages 44 – 51)
Peer-to-Peer Observatory (Second Concept Note)

- **Identify and facilitate engagement with relevant stakeholders in your countries.** Proposed operating agent can reach out through policy, regulatory and academic networks to relevant institutions in member countries for Task participants for confirmation of suitability with ExCo members.
- **Approval** to progress this Task-shared project to a full proposal for the next Executive Committee meeting with University College London (UK) as the proposed Operating Agent

Document H (Pages 52 – 69)
New Task Proposal: Low Carbon Cooling (Concept Note)

- **Consideration** of the rationale, aims and objectives of this research proposal
- **Expressions of interest from countries in participating** (through the provision of financial and/or in-kind (e.g. experts) contributions)
- **Approval** to progress this project to a full proposal for the next Executive Committee meeting with Professor Toby Peters, University of Birmingham (UK) as the proposed Operating Agent

Document I (Pages 70 – 79)
Strategic Plan for next five-year mandate period: March 2020 - February 2025 and transition period (next 18 months)

Purpose of agenda item

- **The TCP needs to reach agreement** on its mission, vision and direction of future work programme. This includes reaching agreement on the timeline for the transition period to relaunch in spring 2020.

Document L (Pages 88 – 92)

Visibility Committee Report (Pages

➤ **Decide on a Theme for the Theme Chapter in the 2018 Annual Report**

As this report is seen as part of our calling card to attract new members, we are suggesting that this year we consider a shorter, more succinct and targeted report. The proposal is to ask each member to submit a one-page outline of their priority areas and how this fits with our new strategic direction as a TCP- the behavioural aspects of the technology/people nexus. We can then edit these submissions down to a cohesive story for the TCP and include it in the annual report.

➤ **Decision to be taken:** The Executive Committee will discuss at the meeting in London the proposed proposal that Karl is putting together with Shawn. No additional work on the website should be done before the members reach a decision on further work.

➤ **Decision to be taken:** Spotlight Newsletter: Would members like to continue having a spotlight newsletter, or do they have other ideas on options for communicating our stories and news.

➤ **Decision to be taken:** Spotlight Newsletter: Should the newsletter continue in its present format?

➤ **Approve** the Visibility Committee report

Plans for the Fifty Third ExCo meeting (Switzerland)

➤ **Approve** plans for the Fifty Third ExCo meeting

Plans for the Fifty Fourth ExCo meeting (Australia)

➤ **Approve** plans for the Fifty Fourth ExCo meeting

AGENDA

**IEA Demand-Side Management Technology Collaboration Programme (DSM TCP)
Fifty-second Executive Committee Meeting
1 – 3 October, 2018
Department of Business, Energy and Industrial Strategy (BEIS),
1 Victoria Street, London, SW1H 0ET, United Kingdom**

Monday 1 October

- 08:30 – 17:00 **DSM Day Workshop** (Department of Business, Energy and Industrial Strategy (BEIS), 1 Victoria Street, London)
- 17.30 – 18:30 **Operating Agents Meeting**
18.30 – **Bilateral Meetings** with interested parties

Tuesday 2 October

- 09:00 – 10:30 **1. GENERAL BUSINESS/WELCOME (ExCo only)**
- 1a. Welcome – *David Shipworth, Even Bjørnstad,*
- 1b. ExCo approval of the Agenda DOC A (4-6)
- 1c. ExCo approval of the Fifty-first ExCo meeting Minutes, Bergen, Norway Distributed earlier
- 1d. Status of the Implementing Agreement - Feedback from EUWP meeting on request for one-year extension – *David Shipworth, Vice Chairman*
- 2. TCP LEADERSHIP/MANAGEMENT**
- 2a. Nomination(s) for Chair – *David Shipworth, other nominees*
- 2b. Decision on whether to contract for an ExCo Operating Agent – *Executive Steering Committee (ESC) + guest speaker Mark Ellis, ExCo Operating Agent, Energy Efficient End-use Equipment (4E) TCP* DOC B
- 2c. Vote for Chair
- 2d. Opportunity to volunteer to join the ESC
- 10:30 – 11:00 **Coffee break**
- 11:00 – 12:30 **3. CURRENT TASKS (ExCo and Operating Agents)**
- 3a. **Task 24** – Phase 2 - Closing the Loop – Behaviour Change in DSM: Helping the Behaviour Changers – Final Management Report – *Sea Rotmann, SEA - Sustainable Energy Advice, New Zealand* DOC C

	3b. Task 16 – Phase 4 – Competitive Energy Services – Final Management Report – <i>Jan W. Bleyl, EnergeticSolutions, Austria</i>	Presentation at meeting
	3c. Task 25 – Phase 2 - Business models for a more effective market uptake of DSM energy services – Task Status Report – <i>Ruth Mourik, DuneWorks, the Netherlands</i>	DOC D
	3d. Operating Agents meeting report – <i>Even Bjørnstad</i>	
12:30 – 13:30	Lunch	
13:30 – 15:00	4. APPROACH TO NEW DSM TCP TASKS (ExCo and Operating Agents)	
	4a. The approach to cost-shared Tasks in 4E TCP – <i>guest speaker Mark Ellis, ExCo Operating Agent, 4E TCP</i>	
	4b. The approach to Task-shared Tasks in EBC TCP – <i>guest speaker Paul Ruyssevelt (Vice-chair, Energy in Buildings & Communities TCP</i>	
	4c. Discussion on approach to new Task structures in DSM TCP	DOC E
15:00-15:30	Coffee break	
15:30 – 17:00	5. NEW TASKS (ExCo and Operating Agents)	
	5a. Empowering automation – <i>Tony Fullelove, Monash University</i>	DOC F
	5b. Peer-to-peer observatory – <i>David Shipworth, UCL, UK</i>	DOC G
	5c. Low Carbon Cooling – <i>Professor Toby Peters, University of Birmingham</i>	DOC H

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

Rejection (or moth-balling)

19:00 Hosted dinner

Wednesday 3 October (ExCo only)

09:00 – 10:30 **6. STRATEGY**

6a. Strategy to 2025 – *David Shipworth, Vice Chairman* DOC I

Review of the IEA collaboration on DSM

10:30 – 11:00 **Coffee break**

11:00 – 12:30

7. TCP MANAGEMENT / GENERAL BUSINESS

7a. Learning from other TCPs – *guest speaker Robin Wiltshire (Chair District Heating & Cooling TCP)*

7b. Member country delegates and engagement: approach to strategic engagement and choosing alternate delegates – *Peter Warren, BEIS, UK*

7c. Report from the ESC – *David Shipworth, Vice Chairman* DOC J

7d. Finance update – *Even Bjørnstad, Vice Chairman* Part 2

7e. Contacts with possible new participants – *Samuel Thomas*

12:30 – 13:30

Lunch

13:30 – 15:00

7f. IEA Relations - Secretariat news – *Jeremy Sung, IEA DSM TCP Desk Officer* DOC K

8. COMMUNICATIONS

8a. IEA communications strategy and implications for the DSM TCP – *Jeremy Sung, IEA DSM TCP Desk Officer*

8b. DSM TCP Annual Report – input from member countries

8c. Programme Visibility Report – *Josephine Maguire* DOC L

15:00 – 15:30

Coffee

15:30-16:30

9. NEXT STEPS IN THE TRANSITION PROCESS

9a. Plans for the Fifty-Third ExCo meeting (April 2019) – *Markus Bareit (Switzerland)*

9b. Plans for the Fifty-Fourth ExCo meeting (October 2019) – *Tony Fullelove (Australia)*

9c. Actions for the remainder of the Review (next month) – *Samuel Thomas*

9d. Actions over the next six months – *David Shipworth, Vice Chairman*

10. OTHER MATTERS

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

Document B

CONTRACTING FOR AN OPERATING AGENT

Purpose of agenda item

- Discussion and agreement on whether to contract for an ExCo Operating Agent (OA) to support the Chair and the ESC and, if so, how to specify and contract for the role.
- Enlistment of volunteers to form a sub-committee to produce the OA specification and run the selection process, if decision is positive towards recruiting an ExCo OA.
- Discussion and agreement on whether to extend Sam Thomas' contract as interim Operating Agent until either the next ExCo meeting **or** appointment of an ExCo OA. If so, then on what terms.

Method

As a background to help inform the discussion and decision, Mark Ellis (4E TCP OA) will join the meeting via telephone to outline how the role is specified and contracted for in his TCP, and to help answer any delegate questions.

Both Mark Ellis and Sam Thomas will then leave the room. Delegates will then discuss the ExCo OA role in the DSM TCP context and make decisions on the issues set out above.

Background

The DSM TCP has been without a chair for a year now, since Rob Kool stepped down. Despite repeated requests, no other country has since been able to offer a resource to take up the mantle of chair.

In August 2018, David Shipworth (UK) put himself forward for the role of Chair until October 2020, contingent upon the TCP agreeing to contract for an ExCo OA or Expert Secretary. The TCP has asked that other member countries consider this offer and also consider if they have a suitable alternative to propose as Chair.

The external review carried out earlier this year set precedent for appointment of an ExCo OA, and outlined the role that an ExCo OA or Expert Secretary to the ExCo plays in other TCPs. This includes reducing the time commitment of chairing the TCP significantly and supporting others in the leadership team by providing a number of supporting services.

It recommended that the TCP considers contracting for an OA in order to make taking on the unfunded role of Chair more viable to potential applicants.

The following sections outline options for the role of ExCo OA and possible tasks to be included in that role based on a review of other TCPs.

The ExCo can see this as menu of options, and should consider it in the light of other supports currently in place within the TCP which may remain in their existing form or be restructured in some way – these include Secretary, Advisor, Newsletter Editor, Web Maintenance, Communications, Publications, and Information Dissemination support.

Specifying the Operating Agent Role

The OA could provide a number of supports to the ExCo in a range of ways, and these are grouped below under headings of administration, communication, information dissemination, task support, financial management and other support, and these options are set out below for consideration.

Time allotted to the performance of the role of TCP OA, across the TCPs reviewed varied between around 1/3 of a Full Time Equivalent (FTE) per year and 50 % in TCPs with either more participants or more initiatives. One full year of an FTE is usually deemed to be around 220 days.

In some of the TCPs reviewed the OA performs the finance functions set out below, and this role is currently carried out by a vice-chair in the DSM TCP.

1. ExCo Meeting Support

- Assist host country and the ExCo Chair with arrangements and communications for two meetings per year.
- Prepare such papers, discussion documents, etc as requested.
- Provide a report on Operating Issues for each ExCo, including details of activities undertaken by the OA, and a report on the financial position of the ExCo.
- Disseminate meeting documents to participants.
- Assist Chair and take minutes during meeting.
- Prepare minutes to be distributed to all ExCo members and to the IEA Desk Officer, prepare key decisions/actions list and follow up actions.
- Lead and minute Executive Steering Committee teleconference calls.
- Maintain a file of key ExCo documents and correspondence.

2. Communications & Co-ordination

- Between ExCo and IEA Secretariat, e.g. preparation of IA Annual Report, IEA documents, End-of-Term Report
- Disseminate information between ExCo Chair and ExCo members, e.g. questionnaires, written procedures, etc.
- With other IEA TCPs and other international organisations
- Develop a strategic engagement plan to promote the TCP to new participants.
- Respond to inquiries from third parties, e.g. from potential TCP participants, and interface with IEA Office of Legal Counsel in this regard
- Maintain and update the communication strategy as required.
- Represent the Chair or the TCP at IEA meetings if ExCo members are unavailable.

3. Information Dissemination

- Compile an ongoing Programme bibliography.
- Maintain the TCP website, containing a public area and a restricted (member) area (allowing access to key documentation)
- Set up and manage a SharePoint site to facilitate document drafting by multiple authors
- Prepare, update and disseminate promotional material, e.g. newsletters, (Task) brochures and summary reports, in accordance with the communication strategy

4. Initiation of Tasks and projects

- Interface with IEA Office of the Legal Counsel.
- Facilitate communications among participants.
- Provide administrative support and contribute to experts' meetings & workshops.
- Promote Task and project participation.
- Where required, organise one-off meetings, Conferences and Seminars

5. Support to Tasks (when established)

- On-going promotion of Task participation & awareness.

- Advise the Tasks' OAs on IEA/IA procedures (e.g. Progress, Annual and Final Reports).
- Initiate regular meetings amongst OAs to explore potential for co-operation and co-ordination.

6. Finances

- Issue invoices for the annual membership fees on behalf of the ExCo, receive financial contributions from the Participants and when required, pursue late payees.
- Establish and maintain a bank account on TCP's behalf, the financial rules of which will be determined by the ExCo.
- Provide analysis and reports on TCP's financial position and other matters as requested by the ExCo.
- Where such support is agreed, issue invoices for the annual membership fees on behalf of individual Tasks, receive financial contributions from the Participants and when required pursue late payee.

7. Other Tasks

- Perform other duties on a reimbursable basis as agreed with the ExCo.

Selection Process

The ExCo would need to select the Operating Agent, ideally through a competitive process, which could be open or restricted.

A selective tender process could involve:

- all ExCo members having the opportunity to put forward candidates
- a sub-committee of ExCo members creating a short-list of candidates to invite to tender
- the sub-committee choosing a preferred candidate based on a review process, potentially including interviews
- the ExCo approving the appointment.

Once in position, the OA would report to the Chair, who along with the vice-chairs would conduct periodic performance reviews and share feedback with the ExCo for input.

Financial Implications

The financial effects of hiring an OA depend on the scope of work specified. At a minimum, the OA should relieve the Chair of most of the day to day operational tasks. Under Rob Kool's Chairmanship, the cost of these work hours were covered by Rob's employer – not the DSM TCP. Most of Rob's expenses were also covered by his employer. Contracting an external OA will therefore increase costs to the TCP. It is estimated that Rob spent 50 days a year (400 hours or one day per week) working as Chair. This provides an estimate of the minimum time of an experienced Chair to maintain an established TCP operating in a 'business as usual' approach. This is not enough time to renew, relaunch, and then run, a substantially more ambitious TCP. The assumption that the OA will perform much of the routine work of the Chair, freeing the chair and other ExCo members to invest their time in growing the TCP. In practice the OA would support much of the activity generated by this growth. Taking on the routine work of the Chair represents the minimum model to be considered in the calculations below.

In order to illustrate the baseline financial effects of engaging an Operating Agent, the following method and assumptions are used:

- The average expenses for the DSM TCP in the three year period 2015 – 2017 are used as baseline. Amounts are converted to Euros.
- For each expense account (category), the number of necessary work hours has been estimated. This estimate is based on an assumed hourly rate for this work in our current model. Where available, these rates are found in relevant invoices.
- The OA is assumed to be a senior consultant, with an hourly rate at 100 EUR.
- The main financial effect of models 2 and 3 below is that the OA replaces and consolidates possibly less costly suppliers on the relevant activities. Please note that for these costings no change in the basic

structure of the TCP's work is assumed. In practice the ambition is to grow the work of the TCP. This growth would come from the unfunded time of the ExCo members, ESC members, Vice-chairs and Chair supported by the OA.

Three "models" or options of an Operating Agent engagement are outlined below, however these are only to serve as illustrations, and the TCP may choose a differently structured model:

- - Model 1: OA is *Chair's personal assistant*. OA performs 90 % of Chair's operational work, with expenses. All other services purchased from external suppliers continue as in baseline.
- - Model 2: OA has *Hands on the wheel*: OA performs work under model 1 in addition to 25 % of all other tasks (secretary, web, communication, etc.).
- - Model 3: OA *Runs the TCP*. This model includes model 1 + all other tasks currently (in baseline model) bought from other suppliers. This model is the most extensive.

In short, all three models assume that the same amount of work as today continues to be done. The main difference between the models, is to which degree the OA hours replace work with lower hourly rates. The calculations for the three models do *not* show the total expenses of running the TCP, but the additional costs/expenses relative to the baseline implied with the different models.

These additional cost calculations are summarized in the table below (monetary values in Euros).

	BASELINE			MODEL 1		MODEL 2		MODEL 3	
	Average annual exp.	Hourly rate	Work hours	OA hours	Added exp.	OA hours	Added exp.	OA hours	Added exp.
ExCo support									
- Secretary	41 010	55	746	0	0	186	8 388	746	33 554
Advisor									
- FourFact	25 367	100	254	0	0	63	-	254	-
Communications									
- Misc. expenses	435	100	4	0	0	1	-	4	-
Annual report									
- Secretary/external DP	5 049	55	92	0	0	23	1 033	92	4 131
- KMGroup (postage)	2 160			0	0				
Spotlight newsletter									
- KMGroup	15 082	72	209	0	0	52	1 466	209	5 865
Brochure/flyer									
- Secretary	877	55	16	0	0	4	179	16	717
- KMGroup	450	72	6	0	0	2	44	6	175
- Misc. expenses	1 298								
Website									
- Karl Weber	13 053	100	131	0	0	33	-	131	-
- Secretary	7 909	55	144	0	0	36	1 618	144	6 471
Financial expenses									
- Misc.	3 537								
Chairman time (50 days)	-	0	400	360	36 000	360	36 000	360	36 000
Chairman expenses	-				10 000		10 000		10 000
Sum	116 225		2 001	360	46 000	760	58 728	1961	96 913

The baseline illustrates how we organize the TCP work today. Note that the baseline includes 400 hours and (assumed) expenses for the Chairman, which appears as zero in our financial account.

Model 1, where the OA performs 90 % of the Chairman's tasks, therefore gives an addition in annual expenses at **46 000 EUR**.

Model 2, where the OA also has some involvement in TCP work in addition to being Chair's "assistant", results in approx. **59 000 EUR** in expenses in addition to the baseline.

Model 3, where the OA in practice runs the TCP as an executive, implies additional expenses close to **97 000 EUR** per year.

A look at the development over time of the common fund reveals that the balance has increased from USD 263 000 in 2010 to USD 326 000 in 2018. Correcting for inflation, this indicates a small increase in the fund in this period. In practice, however, this implies that the baseline model on average roughly maintains the value of our common fund, and that the increased expenses following the different OA models will draw down the fund over time. To sustain our common fund, therefore, we need to increase the income.

Today the annual contribution to the common fund is USD 11 000 or approx. 9 500 EUR. This is paid (in 2017) by 15 members/sponsors. The table below indicates the necessary increase in the annual payments to the common fund, assuming 15 paying entities.

Effect on the TCP	Model 1	Model 2	Model 3
- Total additional cost	46 000	59 000	97 000
- Added annual payment (15 members)	3 067	3 933	6 467
- Number of new members needed for 'break even'	5	6	10

With the assumptions used in these calculation, the annual contributions to the common fund will need to increase by 3 000 EUR in the simplest option (model 1), via 4 000 EUR in model 2, to around 6 500 EUR in model 3, where the OA in practice runs the TCP.

An alternate way to frame this is in terms of increases in the number of new members needed to support the different models while maintaining the current membership fee. To support Model 1 would require recruitment of five new members/sponsors, Model 2 would require six, and Model 3 around ten.

We emphasize that these models are not suggestions or recommendations as to how the work of the TCP should be organized. These are to be regarded as ballpark figures to illustrate financial effects of different OA models and are aimed at supporting the ExCo in its discussion on this issue. The costings in Model 3 highlight the benefit of retaining the role of TCP Secretary, in addition to the possible appointment of an OA, as doing so would reduce Model 3 costs by £33,554 euro, bringing the cost of Model 3 down to ~63K euro. Similarly, delegating the task of competitively outsourcing discrete activities to the OA would also bring savings.

Issues for Consideration in the ExCo Review and Decision

1. Selection - Is this an open process or a restricted process – for example is it an open tender through EU?
2. Do members have someone who they would like to propose as an OA for consideration in applications?
3. What tasks do members think are key for the OA role?
4. In models 2 and 3 there are existing tasks/roles currently carried out by others that are affected by this proposal - what are members' views on this? There is an additional cost in some cases, but is there a benefit in terms of economies of scale, efficiencies, changes in process and output?
5. What are members' views on the cost models for this proposed structure?

TASK 24: PHASE II: BEHAVIOUR CHANGE IN DSM. HELPING THE BEHAVIOUR CHANGERS – Final Task Management Report

Summary

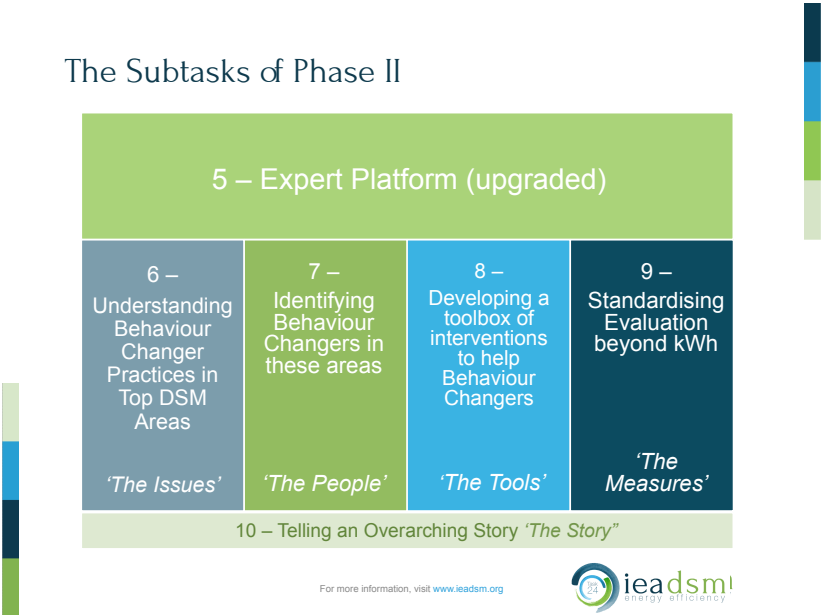
There is no behaviour change ‘silver bullet’, like there is no technological silver bullet that will ensure energy efficient practices. Designing the right programmes and policies that can be measured and evaluated to have achieved lasting behavioural and social norm change is difficult. We believe that this Task, and its extension, helped address these difficulties by developing guidelines, recommendations and examples of best (and good) practice and insights from various cultures and contexts. We rely on a large, global network of sector-specific experts (researchers, implementers and policymakers) from participating and interested countries to engage in an interactive, online and face-to-face expert platform and contribute to a comprehensive database of a variety of behaviour change models, frameworks and disciplines; various context factors affecting behaviour; best (and good) practice examples, pilots and case studies; and guidelines and examples of successful outcome evaluations. Phase I of this Task has been finalised in 2015 and Phase II (How to help the Behaviour Changers) will finalise end of 2018.

Phase II of Task 24 takes the theory into practice. Building on the solid theoretical foundations of [Phase I](#), we now look at the:

- What?
- Who?
- How?
- Why? and
- So What?

We use a Collective Impact Approach methodology and storytelling as the overarching language and bring together Behaviour Changers from all sectors (industry, government, research, service and the third sectors) with the end users whose behaviour they are ultimately trying to change.

The Subtasks of Phase II



For more information, visit www.ieadsm.org



Objectives for the last 6 months

Subtask 5 – Expert Platform

Objectives

- Continue publicising and dissemination of Task 24, including at international conferences

Progress towards Subtask objectives

The usefulness of the Ning Expert Platform has come to a natural end, as most information is now on the IEA DSM Task website and expert collaboration is undertaken via emails or in face-to-face or skype meetings. We use the IEA DSM Events page to advertise workshops and conferences now. All final and draft Task reports are on the IEA DSM website. We continue having great success in matchmaking experts, spending time at each other's Universities, for example, or developing new research collaborations. The Task is widely known and enjoys a great reputation for this matchmaking role among behaviour change experts. This was just evidenced at the recent BEHAVE conference in Switzerland where many Task 24 experts, including current and former national experts, got together to exchange ideas.

The dissemination and publicising of the Task is going extremely well, we have recently published over ten more Task reports and a Spotlight article on our newest participants, the US and Canadian Consortium for Energy Efficiency (CEE).

The two peer-reviewed papers for a Special Issue in the high-profile *Journal of Energy Research and Social Science* (ERSS), which Dr Rotmann also co-edited have been cited 13 times in 2018 and were viewed over 14,000 times. Our introductory article became the most-downloaded paper of ERSS in 2018 (a year after publication, it [still sits at Number 2 in the last 90 days](#)). The [ERSS Special Issue](#) on "Storytelling and Narratives in Energy and Climate Change Research", the largest-ever Special Issue for this publication, has drawn some rave reviews, including by Paul Stern who said it was "*a fascinating collection, pointing toward ways to connect narratives with more standard scientific approaches to energy and climate change analysis, leading to better informed choices. In short, this issue suggests interesting and important directions for doing things like informing decisions in the energy and climate arenas. Kudos and thanks to its editors!*" **Our work on storytelling has probably been the single-greatest academic contributor and is regarded as cutting-edge work.**

Task 24 was honoured to have given the chance to run an international workshop at Europe's largest behaviour change conference, [BEHAVE](#) in Switzerland September 5-7. It was attended by over 60 experts from more than 20 countries, including Brazil, Tajikistan and Iran and has drawn rave feedback. We collected 30 detailed questionnaires during the workshop, which will help inform our last report on the US CEE Task 24 project on **evaluation – methodology, credibility, persistence and hard-to-reach customers**. In addition, we were given the very rare opportunity to run an entire session on the Task 24 / CEE collaboration at the largest behavioural conference, the [BECC](#) conference in October in Washington DC. Our last-ever Task workshop will be run at the Department of Energy the following two days. We also were invited twice to industry-partner only CEE meetings, where our work has garnered great interest and potential for future collaboration.

In addition, we published the Atrium Health Subtask 11 case study at the [ACEEE summer study](#). Our work on the Irish energy saving kit programme was also presented as a conference paper at the 2018 BEHAVE conference and will be presented at the BECC conference as well. These are the three largest behaviour and energy efficiency conferences in 2018.

Subtask 6

Objectives

- Building on work from Subtasks 2 and 4, develop lists of common top 3 DSM *implementable* issues and their potentials in each country
- Use the *Collective Impact Approach* and the Task 24 Expert Platform to research and review current approaches and practices, nationally and internationally, on these top issues and provide feedback from the different disciplinary perspectives and their collaborative discussions and negotiations from available case

- studies and narratives that could illuminate some of the approaches (based on work in Subtask 1, 2 and 7)
- Feed these cases, and the ones analysed in Subtask 1 and 2 into a *Toolbox of Interventions* (ST 8)

Progress towards Subtask objectives

Subtask 6 has now had over 30 workshops, in NL, NZ, CA, SE, IE, US, AT and at the ECEEE summer study (twice) and Energy Cultures, BECC and BEHAVE conferences. The last workshop will be a two-day workshop at the US Department of Energy, following the BECC conference in October. We have discussed the top 3 issues during workshops and have decided on the following main topics, some of which have led to real-life interventions:

- *Powering tomorrow's neighbourhoods* via smart grid sharing and *Home Energy Audit Toolkits (HEAT kits)* in New Zealand;
- *Supporting building management operators in hospitals* to produce better documentation and communication of energy savings in Canada (on hold as the funding didn't eventuate);
- *Empowering building operators in hospitals to re-set BAS set-point overrides* in Charlotte, North Carolina (participant of Subtask 11);
- *Landlords and tenants co-designing green leases in commercial buildings* in Sweden;
- *Promoting better use of ICT in universities* in the Netherlands;
- *Using libraries as Middle Actors to distribute energy-saving kits* in Ireland;
- *Evaluation methodologies, credibility and persistence* in US and Canada;
- *Including better evaluation regimes into the new Austrian EE legislation and*
- *How to improve uptake in shared mobility platforms with the goal to reduce fine air pollution*, both in Austria.

Looking at the wide spread of sectors and behavioural issues above, we have shown that our tools and approaches are widely applicable to all domains we have studied in Phase 1 (building retrofits; smart technology; SMEs; transport) – and we added a few new sectors: hospitals, universities, office buildings, energy utilities and libraries. We have also undertaken in-depth case study reviews on some of these interventions: the [Dutch ICT case in higher education](#) was contrasted with another Dutch University and Cambridge, UK; [green leases in Swedish office buildings](#) were compared with green lease insights in the UK, Australia, Ireland and Norway; and [energy saving kit programmes using libraries as Middle Actors](#) were compared between New Zealand, Australia, the US, Canada and Germany. The US hospital case study was supported by an [international expert panel](#) comprising 4 countries (NZ, US, CA and UK). All country participants' final Subtask 6&7 reports (except for the USA, which will be finalised and published by end 2018) have been completed.

Subtask 7

Objectives

- Identify, with help of the ExCo, National Experts and existing Expert Platform the most appropriate Behaviour Changers focusing on at least one of the top 3 DSM issues chosen by each participating country (can include the residential, business and transport sectors)
- Collect detailed information on their specific interests, organisations and past and current work
- Use the *Collective Impact Approach* to initiate discussions between different disciplinary perspectives and sectoral contexts.
- Develop national Behaviour Changer dialogues in each participating country by holding (bi) annual workshops (1-2 days per country per year, all up maximum of 6 days per country - note some of this time includes work from ST 6 and 8)
- Foster mutual engagement, collaboration and shared learning amongst Behaviour Changers, enable them to build relationships on neutral, trusted ground
- Backbone support to set a common agenda, measurement systems, mutually reinforcing activities and ongoing communication between the Behaviour Changers
- Evaluate Behaviour Changers' impressions on the effectiveness of the *Collective Impact Approach* and use of narratives as a common language to overcome barriers
- Collect examples of successful matchmaking stories.

Progress towards Subtask objectives

Behaviour Changers have been identified for the top issues decided on in Subtask 6 for all participating countries. Their sector stories have been told during workshops and we have initiated deep discussions around relationships, mandates, stakeholders, restrictions and value propositions for each of the Behaviour Changers using the

'Behaviour Changer Framework' during workshops. Subtasks 6 and 7 go hand-in-hand and will be reported on together. A 250+ page Workshop Minutes document is available to all project funders. This includes all stakeholder feedback and evaluations. They were predominantly positive, with storytelling being voted the most enjoyable Task workshop experience, followed by the Behaviour Changer Framework ("magic carpet") exercise. Out of >100 completed feedback forms, not one reported the Task 24 workshop not having been useful, with >80% giving the highest marks ("very useful").

Subtask 8

Objectives

- Use the [Collective Impact Approach](#) to unite Behaviour Changers from all 5 sectors on a specific DSM issue (both chosen in ST 6 & 7) and develop, in collaboration, a common agenda, shared measurement indices, mutually reinforcing activities (a 'roadmap'), continuous communication and the backbone support function necessary to make it happen.
- Collect information for a [Decisionmaking Tree](#) to pick the most appropriate case studies and models of understanding analysed by Task 24 and test its usability with the Behaviour Changers
- Develop the *common language of storytelling* further and provide different examples of using storytelling and narratives in practice and how to best do it in the specific areas of focus and each of the Behaviour Changers' sectors
- Identify all the tools in each Behaviour Changer's [Toolbox of Interventions](#), analyse their pros and cons, risks and opportunities, where they fall short and how another tool from another Behaviour Changer could overcome this deficit
- Continued testing and development of the [Evaluation Tools](#) (ST 3) that can prove if a (toolbox of) intervention/s leads to actual, ongoing behaviour changes in practice. The Behaviour Changers will feed back on its potential applicability, risks and additional needs by working through (hypothetical or real life) examples chosen in ST 6 and using double-loop learning approaches to assess multiple benefits of interventions
- Collaborative development of a testable *Toolbox of Interventions* for each top DSM focus area, where each Behaviour Changer sector has clearly identified and measurable roles and responsibilities. This intervention may then be taken into a real-life setting and trialed in practice (either as ST 11 or outside of Task 24)
- The toolbox is built on *national and sectoral context specificities* but will be synthesised and tested (e.g. in the international conference (ST5)) for the general aspects that are of international validity (ST10 - the overarching story).

Progress towards Subtask objectives

The Special Issue on Storytelling for the Journal of *Energy and Social Science Research* provides [a very detailed and in-depth overview of cutting edge research](#) on storytelling, including our [own use of the fairy tale story spine](#). Our 'Behaviour Changer Framework' collaboration tool [was published at the ACEEE summer study](#) and the [BEHAVE conference](#) and won an award at the [ECEEE Summer Study](#) last year. We have successfully trialed design charettes to co-design a pilot intervention in the 2nd largest hospital network in North America, CHS, as part of Subtask 11. This was just published at the [ACEEE summer study 2018](#). The Decision-making Tool has been drafted by Duneworks and we collected insights on multiple benefits of interventions in each of our country workshops. The final [Subtask 8 Toolkit for Behaviour Changers](#) is now available as an easily-viewed 70 slide deck.

Subtask 9

Objectives

- The goal of this research is to develop and validate a set of tools and metrics that can be used consistently for the evaluation of behaviour-based energy programmes, including but not limited to, eco-feedback, home audits, information and rebate programmes, and social games
- An in-depth assessment of current (best) practice, cultural and disciplinary idiosyncrasies, country drivers and needs and the best possible international standard (along the lines of psychometric tools like the IQ test - arguably not a perfect indicator of intelligence, but valuable in terms of enabling measurement and comparison).

Progress towards Subtask objectives

Karlin (the Principal Investigator of this Subtask) et al. have published papers at the IEPEC conferences in [August 2015](#) and [2016](#). These peer-reviewed papers outline the basics of the *Beyond kWh* toolkit they are developing for

Subtask 9. The results from [the psychometric testing](#) were published by the IEA DSM Task 24. This work was co-funded to the tune of ~US\$100,000 by PG&E and Southern California Edison. The tool was not able to be validated in each of the participating countries as only 3 countries paid to contribute (instead of the 4 needed for the contract). However, the tool has been tailored and tested on the highly-relevant residential energy-savings kit trial in Ireland and by CEE sponsor Vermont Energy Investment Corporation (VEIC). We have modified it to fit [commercial office buildings for the Swedish Energy Agency](#) and have received interest at the BEHAVE conference to utilise it in a Swiss study on uptake of electric vehicles. This tool will be part of a standardised, internationally-validated process of how to do behaviour change from design to dissemination (“The See Change Institute Process”).

Subtask 10

Objectives

- Collate, analyse and distil all information collected in Subtasks 6-9.

Progress towards Subtask objectives

All country policy briefs will be collated to form the Subtask 10 collection. This will be finalised with the US Policy Brief which will be available end of 2018.

Objectives for the next 6 months

Subtask 5

BECC conference presentation on Irish home energy saving kits and special session on Task 24 / CEE participation.

Subtask 6

Finalise and publish all country reports (by ExCo meeting).

Subtask 7

One more workshop in the US in October 2018.

Subtask 8

Toolkit published.

Subtask 9

Two presentations at BEHAVE and BECC conferences, Irish evaluation report published.

Subtask 10

Final report with all policy briefs by end 2018.

Outreach

Outreach of this Task was successful and manifold. Three more papers were presented at the ACEEE summer study, BEHAVE and BECC conferences. A final international expert workshop (the 4th!) was held at the BEHAVE conference and attended by over 60 participants from 20 countries. The Task 24 work was also presented at the IEA’s G20 meeting in Paris on September 12 and at the CEE Industry Sponsor meeting in New Orleans on Sept 18. Two H2020 research programmes and several non-state actors from industry, local government and the third sector, have engaged with, or built on our Task work. Several international awards were won for work co-designed by this Task, including the **EU’s Sustainable Energy Award** for the Irish home energy saving kit and the Association of Energy Engineer’s **Region II Energy Innovator of the Year Award** for Kady Cowan, of the Subtask 11 *Energy Connect* programme. The 60+ workshops, and 60+ seminars, lectures and conference presentations given by Task 24 over the last 7 years are provided in the Appendix. There is also a list of all collected Task 24 publications and outreach activities. It is by far the most successful of all IEA DSM Tasks in terms of outreach, having reached over 10,000 experts from 30+ countries.

Experts meetings/seminars/conferences held in past six months

Seminars/Conferences/Lectures

Date	Place	Participants	Type of meeting	Government	Industry	Academic
May 2018	Boston, US	>100	Conference		100	
Sept 2018	BEHAVE, Zürich	>60	Special Session			
Oct 2018	BECC, Washington DC	>100	Conference			

Experts and stakeholder meetings

Date	Place	# of Experts	Type of meeting	Government	Industry	Academic
Apr 2018	Wellington	20	SHM	5	10	5
Apr 2018	San Francisco	20	SHM	1	17	3
Sept 2018	BEHAVE, CH	>60	EX			
Sept 2018	G20, Paris	>50	SHM			
Sept 2018	EUWP, Paris	>50	SHM			
Sept 2018	CEE, New Orleans	>100	SHM		100+	
Oct 2018	BECC, Washington DC	>100	EX			
Oct 2018	DoE, Washington DC	15	EX	2	13	

Ideas for new work

Task 24 has previously put forward a concept paper for how to ‘do behaviour change from A-Z’, together with our project partner, [SEE Change Institute](#). This was discussed at the 50th ExCo meeting but its scope, which went beyond usual Task format, was considered too broad. A survey for ExCo, based on their feedback was developed in December 2017. However, it was unfortunately never sent, on advice by the Vice Chairs. The current draft strategy, even though clearly informed by Task 24 work, does not seem to have made room for a specific Task 24 extension. This is why this marks the end of this work, and the extensive expert network and future possibilities for collaboration, with the DSM Programme.

We continue to have many ideas of what other work could be done, either as extension or new Task (a full proposal has even been developed on Energy-Saving Kits but it did not receive enough support in the short time left before this meeting). There is also still a possible need for a “Behaviour Change Advisor”, similar to the ExCo Operating Agent and funded out of the Common Fund, who can help scope out the wider behavioural work streams and possible new Operating Agents and Project Partners, as signalled by the draft strategy. The Task 24 Operating Agent has by far the widest international network of such possible experts and OAs and could help scope and develop the wider connections, e.g. with G20 who now have a behavioural focus, other IEA TCPs, the Secretariat and other international research networks focusing on this “human-centered energy system”. However, it unfortunately does not seem that the ExCo considers the value of this Task and its networks to bring the ambitious new strategy to fruition.



Activity Time Schedule

We are just finishing up the US participation, by end of 2018 as signed off after Bergen in 2018.

Finance

All invoices have been paid and budget is on track.

Matters for the ExCo

Please accept this Status Update.

Participating Countries/Partners

Austria (only 2 years), New Zealand, Sweden, The Netherlands (only 2.5 years), Ireland, US and Canada (last year and in-kind co-funding of ST3, 9 and 11).

Appendix 1. All collective outreach activities by Task 24

Task 24 Expert Workshops & stakeholder meetings (Phase I)

Date	Place	# of Experts	# of Countries	Type of meeting	Government	Industry	Academic
10/4/12	Utrecht, NL	23	4	XM	4	9	10
10/4/12	Graz, AUT	5	2	SHM	4	1	1
11/4/12	online	13	6	XM	2	2	9
3/5/12	online	6	5	XM	1	1	4
30/8/12	Utrecht, NL	20	1	SHM	2	12	6
7/9/12	Brussels, BE	24	8	XM	3	8	13
9-10/10/12	Oxford, UK	65	9	XM	3	13	39
26/10/12	online	6	5	XM		2	4
12/11/12	online	6	5	XM		2	4
17/12/12	Wellington, NZ	10	1	SHM	8	1	1
20/12/12	Utrecht, NL	22	1	SHM	1	14	7
7/2/13	online	6	5	XM		2	4
15/2/13	Wellington, NZ	50	4	XM	15	15	20
22/5/13	Graz, AUT	10	2	SHM	9	1	
27-29/5	Trondheim, NO	20	8	XM	1	3	17
15/6/13	Milan, IT	15	2	SHM	14	1	
17/6/13	Dubai, UAE	30+	3	SHM	5	15	other (kids)
21/8/13	Wellington, NZ	6	1	SHM	4	1	1
10/10/13	Stockholm, SE	12	2	SHM	4	1	7
15/10/13	Luzern, CH	30	9	XM	3	12	15
17/10/13	Brisbane, AUS	12	2	SHM	10	2	
17/12/13	Wellington, NZ	40	1	SHM	30	4	6
17/03/14	Wellington, NZ	55		XM	25	15	15
05/09/14	Oxford, UK	18		XM	2	3	13
Feb & July 2014	Wellington, NZ	5		SHM	3	2	
12/5/14	Brisbane, AUS	12		SHM	10	2	
3/10/14	Milan, Italy	10		SHM	7	2	1
13-14/14	Graz, Austria	40		XM/SHM	20	5	15
24/10/14	London, UK	12		XM	5	2	5

XM = Experts meeting

SHM = Stakeholder meeting

In green = national expert workshops and webinars

Phase II – Expert and stakeholder meetings

Date	Place	# of Experts	Type of meeting	Govt	Industry	Academic
27/05/15	Toronto, Canada	13	SHM	2	9	2
03/06/15	Eceeee summer study	50	Experts	10+	5+	30+
11/06/15	Stockholm, SE	8	SHM	3	4	1
14/06/15	London, UK	12	SHM	3	2	7
23/09/15	Wellington, NZ	12	SHM	3	6	3
19/10/15	Sacramento, US	15	Experts	2	4	9
21/10/15	Sacramento	31	Experts	4	9	18
26/10/15	Toronto, CA	15	Experts	2	11	2
2/11/15	San Francisco	30	SHM	4	24	2
Nov 2015	Paris, France	40	Experts	15	15	10
Nov 2015	Dublin, Ireland	>60	SHM	20	20	20
Dec 2015	Brisbane, AUS	10	SHM	7	3	
Feb 2016	Eindhoven, NL	25	SHM			25
Feb 2016	Wellington, NZ	12	SHM	3	6	3
Mar 2016	Stockholm, SE	10	SHM	4	3	3
Apr 2016	Dublin, IE	12	SHM	6	3	3
Jun 2016	Wellington, NZ	8	IEA	4	2	2
Jul 2016	Wellington, NZ	35	SHM, EX	10	10	15
Sep 2016	Coimbra, PO	70+	EX			
Oct 2016	Stockholm, SE	10	SHM	4	4	2
Oct 2016	Charlotte, N.C.	15	SHM	1	12	3
Jan 2017	Dublin	15	SHM	8	5	2
Feb 2016	Charlotte, N.C.	20	SHM		16	4
Mar 2017	Netherlands	?	SHM			
May 2017	Stockholm	10	SHM	4	3	
May 2017	Graz	15	SHM	1	12	
May 2017	Dublin	10	SHM	8	2	
Sep 2017	Graz	20	SHM		16	
Mar 2018	Charlotte, N.C.	20	SHM	8	5	2
Apr 2018	Wellington	20	SHM			
May 2018	Boston, US	50	SHM	1	45	4
Sept 2018	BEHAVE, Zürich	>40	EX			
Sept 2018	New Orleans, US	70	SHM		70	
Oct 2018	Washington, DC	25	SHM			
Oct 2018	BECC Conference, US	>100	EX			

Seminars and conferences Task 24 was presented at (Phase I)

Date	Place	Total # Experts	# of countries	Type of meeting
8/5/12	Linköping, SE	20	2	Presentation to University
29-31/8/12	Basel, CH	~300	15+	Task Presentation at 3rd Intl Sustainability Conference
19/9/12	Helsinki, FI	20	3	Task Presentation to Finnish Experts
20-21/9/12	Helsinki, FI	~250	15+	Task Presentation and session chairing at BEhavE conference
24-25/10/12	Berlin, GER	100s	10+	Attendance at EEIP 'Energy Recovery in Industry: Opportunity for energy efficiency' conference
13-14/2/13	Wellington, NZ	100+	6	National Energy Research Institute conference 'Energy at the Crossroads'
13/3/13	Paris, FR	30+	28	Presentation to IEA Secretariat Behaviour Workshop 'Choices, Decisions and Lifestyles Roundtable'
24/4/13	Utrecht, NL	50+	12	DSM Workshop 'The NL Polder Model', 2 presentations
7/6/13	Hyères, FR	450+	45	IEEE summer study, 1 presentation, 3 informal sessions
8/7/13	Nisyros, Greece	100+	10+	Task 24 presentation by Swiss expert at ELCAS
7/10/13	Copenhagen, DE	100+	15+	IEEE ISGT conference - also leading Consumer Behaviour panel
16/10/13	Luzern, CH	30+	10+	IEA DSM Workshop
8/10/13	Stockholm, SE	8	2	Presentation at Technical Institute Stockholm
11/10/13	Brisbane, AUS	25	2	Skype lecture to Qld University energy efficiency course
20/11/13	Sacramento, US	500+	15+	BECC Conference presentation
20/11/13	Sacramento, US	25+	6	Transport panel at BECC conference
2/12/13	Flanders, BE			Smart Grid conference
12/12/13	Bonn, DE			Expert Roundtable on Energy Efficiency & Behaviour in Developing Countries, German Development Institute
18/3/14	Wellington, NZ	>100	12	NERI conference
12/5/14	Brisbane, AUS	15	2	Lecture at International Energy Center
9/8/14	Washington DC, USA	<100/10000	>25	APA conference
4/9/14	Oxford, UK	<300	>20	BEHAVE conference
11/9/14	Berlin, GER	180	>15	IEPPEC conference
10/10/14	Brisbane, AUS	>10	2	IEC Skype Lecture
23/10/14	Sheffield, UK	>40	2	Seminar at Sheffield Hallam Uni
21-22/1/15	Milan, IT			ESCO lecture
14/1/15	DSM University (online)			Task 24 webinar

Phase II – Seminars, lectures and conferences

Date	Place	Total # of Experts	Type of meeting	Govt	Industry	Academic
26/05/15	Toronto, CA	40+	Seminar	10	25	5
11/06/15	Stockholm, SE	20	Seminar	20		
13/05/15	DSM University	>100	Webinar			
02 to 06/06	eceeee summer study	500	Conference			
19/10/15	BECC	700	Conference			
28/09/15	Australia	20+	Lecture			
Nov 2015	Dublin	>60	Mini conference	20	20	20
Dec 2015	Australia	20+	Lecture			20+
Dec 2015	Eindhoven, NL	30	Lecture	10	20	90
Feb 2016	Wellington, NZ	50+	Workshop		50+	
Apr 2016	Vienna, AT	>150	Workshop			
Jul 2016	Wellington, NZ	>250	Conference			
Aug 2016	Monterey, US	>1500	Conference			
Sep 2016	Australia	20+	Lecture			20+
Sep 2016	Coimbra, PO	30	Lecture			
Oct 2016	Stockholm, SE	80	Conference			
Feb 2017	Charlotte, N.C.	12	Expert panel		8	4
Feb 2017	Wellington, NZ	>50	Conference			
May 2017	Dublin, IE	~80	Conference			
Jun 2017	eceeee summer study	500	Conference			
Jun 2017	IEA Secretariat	70	IEA workshop			
Oct 2017	BECC	700	Conference			
Oct 2017	EGRD, Copenhagen	30	IEA workshop			
Oct 2017	Australia	>20	Lecture			
Dec 2017	DSMU	150	Webinar			
Jun 2018	EU Sustainable Energy Week	~100s	Conference			
Aug 2018	ACEEE Summer Study	~700	Conference			
Sep 2018	BEHAVE	~400	Conference			
Oct 2018	BECC	~700	Conference			

Appendix 2. All collected Task publications

Task 24 Publications, films and reports – Phase I

- IEA DSM [Initial Positioning Paper](#) on Behaviour Change*
- IEA DSM Task 24 [Final Workplan](#)*
- IEA DSM Spotlight Issues (6 stories)*
- IEA DSM Task Flyer 24 (updated and final)*
- [IEA DSM website Task 24](#)*
- Positioning paper and minutes from Brussels workshop*
- [Positioning and definitions paper](#) and UKERC report from Oxford 2012 workshop*
- 25 minute [professional film](#) summarising Oxford workshop
- [Template](#) for Models of Understanding Behaviour via Case studies in 4 domains
- IEA DSM Task 24 Pecha Kucha presentation (powerpoint/film)^
- 6 participating countries' Pecha Kucha presentations (powerpoint/film)^
- [Interviews of experts' own energy stories](#) (film, over 30 so far)^
- NZ World Café report-back (film/presentations/documents)^
- BECC (2013) presentations on Task 24 and transport behaviour^
- [Overview of definitions](#) and how they were derived (powerpoint)*
- Overview of models of understanding behaviour (powerpoint/film)^
- NL, Swiss and NZ stakeholder analyses (Excel)^
- Implementation bloopers (powerpoint/film)^
- 10 presentations on various aspects of behaviour change models (powerpoint/film)^
- Interview with www.energynet.de (podcast)
- ["The Monster" Analysis of Subtask 1](#) (160pp report)*
- The Monster Task 24 Wiki^
- [The Little Monster storybook](#) (self-published booklet)*
- Green Growth Article (2013)*
- [Presentation](#) to Energy Savers Dubai, UAE June 2013
- Presentation and 3 informal workshops at eceee June 2013
- Task 24 presentations at RSE (Milan, Italy); Leeds University (UK); Linköping University (Sweden); Stockholm Technical Institute (Sweden); Grazer Energy Agency (Austria); Energy Efficiency and Conservation Authority and Ministry of Business, Employment and Innovation (both New Zealand); UC Irvine (USA); International Energy Center (Australia); Queensland Government (Australia); Sheffield Hallam University (UK)^
- Conference and workshop presentations at Utrecht DSM workshop (NL); eceee Summer Study (France); ELCAS (Greece); IEEE ISGT (Denmark); Luzern DSM Workshop (CH); BECC conference (US); BEHAVE conferences (Finland and UK); Espoo DSM Workshop (Finland)^
- [Energy Expert Stories](#) short film
- Filmed presentations from Storytelling workshop in Wellington ([youtube](#))
- [ESCo Facilitators report](#) and [5 page summary](#) for Task 16*
- Articles for Energy Efficiency in Industrial Processes Magazine (<http://www.ee-ip.org/>)
- Six ST2 country case study reports (NL, NZ, SE, NO, AT, CH)*
- Eight ST4 country recommendations*
- Three ST3 reports*
- *Peer-reviewed:*
- [ECEEE summer study \(2013\) paper on Task 24 by Rotmann and Mourik](#)*
- [ELCAS \(2013\) paper by Carabias-Hütter, Lobsiger-Kagi, Mourik and Rotmann \(2013\)](#)*
- [Evaluation Paper for IEPPEC](#)*
- [Task 24 – Subtask 3: eceee 2015 summer study evaluation paper](#)
- [Task 24 – Subtask 3: From calculated to real energy savings performance evaluation: an ICT-based methodology to enable meaningful do-it-yourself data collection](#)
- [Task 24 – Subtask 5: eceee 2015 summer study storytelling paper](#)

➤ indicates reports that are on the [IEA DSM Task 24 website](#)

^ indicates presentations and films etc. found on the invite-online [online expert platform](#)

Phase 2 publications

(not highlighted are reports for National Expert use only or yet-unpublished reports):

Subtask publications:

- [Task 24 – Phase II: Work Plan](#)
 - [Subtask 6&7 – Draft Report The Netherlands: Executive Summary plus Annexes](#)
 - [Subtask 6&7 – Case Study Analysis – ICT Use in Higher Education – The Netherlands](#)
 - [Subtask 6&7 – Draft Report New Zealand](#)
 - [Subtask 6&7 – Case Study Analysis – Home Energy Audit Tool \(HEAT\) kits in New Zealand](#)
 - [Subtask 6&7 – Draft Report Sweden](#)
 - [Subtask 6&7 -Background for Green Leases in Commercial Office Buildings – Sweden](#)
 - [Subtask 6&7 – Collaboration and Green Leasing: A case study of the Swedish Energy Agency’s new office building in Eskilstuna](#)
 - [Subtask 6&7 -Background for Green Leases in Commercial Office Buildings – Sweden](#)
 - [Subtask 6&7 – Draft Report Ireland](#)
 - [Subtask 6&7 – Cross-Country Case Study Analysis Home Energy Saving Kit Library Programmes – Ireland](#)
 - [Subtask 6&7 – Cross-Country Case Study Comparison Ireland – Database of Energy Saving Kit Programmes](#)
 - [Subtask 6&7 – Draft Report USA](#)
 - [Subtask 6&7 – Final Report Austria](#)
 - [Final Report to Funders Austria \[in German\]](#)
 - [Policy Brief Austria](#)
 - [Policy Brief the Netherlands](#)
 - [Policy Brief Ireland](#)
 - [Policy Brief Sweden](#)
 - [Policy Brief New Zealand](#)
 - [Policy Brief USA](#)
 - [Subtask 8 – How to Create a ‘Magic Carpet’ for Behaviour Changers](#)
 - [Subtask 8 – Toolbox for Behaviour Changers](#)
 - [Subtask 8 – The A to Z of Storytelling in Task 24](#)
 - [Subtask 8 – Template for Focus Groups in Task 24](#)
 - [Subtask 8 – Case Study Templates in Task 24](#)
 - [Subtask 8 – Decision-making Tree for Subtask 1 “Monster” case study analysis](#)
 - [Subtask 9 – ‘Dimensions of Energy Behavior: Psychometric Testing of Scales for Evaluating Behavioral Interventions in Demand Side Management Programs’](#)
 - [Subtask 9 – Using Bayesian Modelling to test the “beyond kWh” toolkit on Irish residential energy saving kits programme](#)
 - [Subtask 10 – Overarching story \(to be published\)](#)
 - [Subtask 11 – CHS case study: Designing a successful behaviour change programme for hospital building staff](#)
- **Peer-reviewed publications:**
- [Subtask 6 – K. Janda, S. Rotmann, M. Bulut and S. Lennander \(2017\), *Advances in green leases and green leasing: Evidence from Sweden, Australia, and the UK*, ECEEE Summer Study Proceedings, Hyères, France.](#)
 - [Subtask 6 – S. Rotmann and D. Chapman \(to be published\). ENERGY SAVING KITS – EDUCATING AND EMPOWERING END USERS? A Cross-Country Case Study Comparison. BEHAVE conference 2018, Zürich, Switzerland.](#)
 - [Subtask 8 – S. Rotmann \(2016a\), *How to Create a ‘Magic Carpet’ for Behaviour Change*, ACEEE Summer Study Proceedings, Monterey, USA.](#)
 - [Subtask 8 – S. Rotmann \(2016b\), *How to Create a ‘Magic Carpet’ for Behaviour Changers*, BEHAVE Conference, Coimbra, Portugal.](#)
 - [Subtask 8 – S. Rotmann \(2017a\), *“Once upon a time...” Eliciting energy and behaviour change stories using a fairy tale story spine*, Energy Research and Social Science, Special Issue on *Storytelling in Energy and Climate Change Research*.](#)
 - [Subtask 8 – S. Rotmann \(2017b\), *Task 24: Co-creating behaviour change insights with Behaviour Changers from around the world*, ECEEE Summer Study Proceedings, Hyères, France.](#)
 - [Subtask 8 – Special Issue on “Narratives and Storytelling in Energy and Climate Change Research”, ERSS](#)

- [Volume 31, September 2017.](#)
- [Subtask 8 – M. Moezzi, K. Janda and S. Rotmann \(2017\), *Using stories, narratives, and storytelling in energy and climate change research*, Energy Research and Social Science, Special Issue on *Storytelling in Energy and Climate Change Research*.](#)
- [Subtask 9 – B. Karlin, R. Ford and C. McPhearson Frantz \(2015\), *Exploring Deep Savings: A Toolkit for Assessing Behavior-Based Energy Interventions*, IEPEC Conference, Long Beach, USA.](#)
- [Subtask 9 – B. Karlin, R. Ford and C. McPhearson Frantz \(2016\), *Evaluating Energy Culture: Identifying and validating measures for behaviour-based energy interventions*, IEPEC Conference, Amsterdam, Netherlands.](#)
- [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.](#)

Articles, blogs, Spotlight etc:

- [Task 24 – Phase II Flyer](#)
- [Task 24 Policy Brief](#)
- [Spotlight September 2015 – Task 24: Helping the Behaviour Changers](#)
- [Spotlight December 2015: New Publication – Task 24 Subtask 2: The ‘Energy Hunt’ in Austria](#)
- [Spotlight June 2016 – Task 24 and Annex 66: A beautiful collaboration is emerging](#)
- [Spotlight March 2017 – Task 24: Creating ‘Magic’ with non-state actors](#)
- [Spotlight June 2017 – Dr Sea Rotmann: DSM Day in Dublin – Behavioural insights on energy efficiency in the residential sector](#)
- [Spotlight Sept 2017 – Hot of the Press! A new Special Issue on Storytelling](#)
- [Spotlight June 2018 – Task 24 studies Energy Saving Kit Programmes in Ireland and NZ](#)
- [Spotlight September 2018 – Task 24’s latest participants: the US and Canada via the CEE](#)
- [Energy News – Energy Projects need to center on End Users](#)
- [University Health Network \(UHN\) Toronto: Talkin’ Trash with UHN](#)
- [Energy in Demand – IEA DSM collaboration programme’s Task 24 Gets Published in Special Issue on ‘Storytelling and Narratives in Energy and Climate Change Research’](#)
- [ecee News – Special issue of the ERSS journal discusses narratives and storytelling, as a supplement to traditional scientific methods](#)
- [IEA Expert Group on Research and Development \(EGRD\), 2018. Towards a consumer-driven energy system.](#)

Workshop Minutes:

- [Subtask 6 and 7 – ECEEE Summer Study Task 24 workshop minutes \(2015 and 2017\)](#)
- [Subtask 6 and 7 – BECC conference Task 24 workshop minutes \(2015\)](#)
- [Subtask 6 and 7 – BEHAVE conference Task 24 workshop minutes \(2016 and 2018\)](#)
- [Subtask 6 and 7 – Canada Workshop minutes](#)
- [Subtask 6 and 7 – Sweden workshop minutes](#)
- [Subtask 6 and 7 – Ireland workshop minutes](#)
- [Subtask 6 and 7 – Netherlands workshop minutes](#)
- [Subtask 6 and 7 – New Zealand workshop minutes](#)
- [Subtask 6 and 7 – Carolinas Health Services workshop minutes \(USA\)](#)
- [Subtask 6 and 7 – CEE workshop minutes \(USA\)](#)
- [Subtask 6 and 7 – Combined workshop minutes](#)

Online sharing and administration of Task 24

- Via @IEADSM on twitter (also @DrSeaRotmann), IEADSM [facebook](#) group; ECEEE and EEIP columns
- Weekly publication of [Behaviour Change & Energy News](#) by Dr Sea Rotmann
- Expert platform www.ieadsmtask24.ning.com
- Task 24 dropbox (www.dropbox.com) to share templates and collected models etc.
- Task 24 wikipedia (www.ieadsmtask24wiki.info)
- Task 24 [youtube channel](#) ()
- Task 24 slideshare (<http://www.slideshare.net/drsea>)

Document D

TASK 25: BUSINESS MODEL STRATEGIES FOR A MORE EFFECTIVE MARKET UPTAKE OF ENERGY SERVICES FOR AND BY SMEs AND COMMUNITIES - Task Status Report

Operating Agents

Dr. Ruth Mourik
0031 6 25075760
Ruth.mourik@duneworks.nl

Renske Bouwknegt
0031638891557
renske@ideate.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. At the time of writing this report, the contract with Sweden and the Netherlands was finalised, but the official participation of Australia (with a first payment) was not yet secured.

Work for this task phase 2 therefore only just started before summer for the Netherlands and Sweden, and has not yet started for Australia. We plan a first national expert meeting in London, the 30th of September to officially kick-off the work and discuss the objectives for the next 6 months.

Subtask 1: Task Management

Start date: month 1, end date month 24

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 in April 2018 and presented both at the DSM day and at the exco
- A half-yearly task status report was written.
- Several attempts have been made to involve further participants, e.g. Korea, Austria, Ireland.

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

Start date or starting event: Month 1, End date: Month 18

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

None in this period

Progress

- The operating agents have started with the literature review on business models for demand response services and for new actors driven/community energy services. A first draft of the report is expected by the end of 2018

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

Start date or starting event: Month 1, End date: Month 18

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

None in this period

Progress

- The operating agents have started with the literature review on business models for demand response services and for new actors driven/community energy services. A first draft of the report is expected by the end of 2018

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

- 1 Investigating the different kinds of policy support are 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.
- Before the first expert meeting set to take place September 30th in London, 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 24

Activities

1. 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.
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

Academic publications

- Due to timing issues, and in spite of an almost finalised peer review (paper was accepted and some final editing was to be performed) the submission on the phase 1 results to the journal Energy Efficiency was cancelled and we are now submitting the paper to a different journal.

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.
- Ideate is creating an animation video on the findings in phase 1
- 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

Expert meetings/Seminars/Conferences

Date	Place	Participants	Type of meeting	contribution	Number 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 th september 2018	London	Task Experts	Task Expert meeting		10

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 24

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 in October in London-UK
- Preparing the Annual Report for 2018 for Task 25

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

Start date or starting event: Month 1, End date: Month 18

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 are 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.

Progress

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

- The fall newsletter of TKI Urban Energy will publish an interview with Ruth Mourik about the IEA work.
- We will provide 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).
- Submission of paper on findings from phase 1 to Renewable and Sustainable Energy Reviews Journal
- In conjunction with a small project for the Dutch Innovation Agency Topsector Kennis Innovatie Urban Energy, Task 25 will provide a training workshop at the TKI conference October 4th in the Netherlands for a maximum of 30 policy makers, entrepreneurs and researchers.
- 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
October 2018	Netherlands	mixed	Workshop on Task 25 as part of the Dutch TKI Urban Energy workconference	Workshop leader and presenter	30

Outreach

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

Time schedule

Time schedule for last 6 months

month	1	2	3	4	5	6
month	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18
Subtask 1: Management of the task						
1.2 Exco meetings	x					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	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						

Financial matters

Staff costs with 3 participating countries	100000	Hours 1200 (400 per paying country)
Travelling + outreach materials	20000	
TOTAL TASK BUDGET	Euro 120000	

Progress Budget

- At the time of writing Sweden, Netherlands has paid the first invoices.
- Australia has committed to pay the first invoice asap.

Matters for the ExCo

1. Approval of later end-date for Phase 2 considering the delays in contract finalisation. Our proposal is to allow for the Task to run until the ExCo in fall of 2020 instead of the ExCo spring of 2020. Against no additional cost for participating countries.
2. We request a discussion on improving the (interface of the) website. It is proving very difficult to get reports etc. online on the website, there are multiple bugs in the system.

Ideas for new work

Not applicable

Participating countries

1. Sweden
2. Netherlands
3. Australia
4. Italy (under special conditions)

Document E

OPTIONS FOR STRUCTURING FUTURE TASKS

Purpose of agenda item

Discussion and agreement to enable different task structures to be used for new Tasks.

Familiarise delegates with task structures used in other TCPs.

Method

Guest speakers - Mark Ellis, 4E TCP ExCo Operating Agent (via remote access) and Paul Ruyssevelt, EBC TCP Vice-Chair (in person) - set out the way in which they structure and manage the Tasks in their TCPs.

Speakers take questions from delegates.

Background note compares approaches to task structure.

External reviewer to set out key points from analysis of different options.

Discussion on applicability of different approaches to potential new DSM TCP projects.

In advance: all delegates to read background note and form questions for the guest speakers and points for the discussion.

Background

Section 5 of the external review report set out different ways of structuring Tasks used in other TCPs. Two main alternatives were set out: (i) the task-shared model, where no funds are pooled and the Operating Agent is provided by one of the participating countries; and (ii) the 4E TCP cost-shared model, where funds are pooled and managed by a committee of participants, which contracts for an operating agent using some of the funds. The ways in which the approaches differ and compare with the current DSM TCP approach are set out in the Table below:

	Current DSM TCP model	EBC TCP Task-shared model	4E TCP Cost-shared model
Participating countries pool funding	Yes	No	Yes
Management of Pooled Funding	By Operating Agent, reporting to ExCo	n/a	By committee of country participants, reporting to ExCo
Responsibility for Task Reporting	Operating Agent, reporting to ExCo	Operating Agent, reporting to ExCo	Annex (Task) Chair supported by Operating Agent, reporting to ExCo
Typical Task participants	Mixture of policy makers, practitioners, industry representatives and academics, varying by Task	Mostly academics	Mostly policy makers or government agency representatives
Task plenary meetings	Not stipulated	Every six months	Every six months, including one in every two

			alongside TCP ExCo meeting
Initiating Tasks	A concept note is produced for the ExCo in order to gauge interest. At the following meeting a detailed proposal is tabled for approval having first held an experts' meeting . Proposals can be produced ExCo members, or more usually in recent years, by Operating Agents of existing tasks proposing new Task phases.	A concept note for the ExCo must be produced, often by the prospective Operating Agent. If agreed by ExCo, an international workshop is held and a full proposal is developed for next ExCo meeting for approval and selection of Operating Agent.	1-2 years of planning before initial proposal to ExCo from lead country ExCo member. Can typically take another 1-1.5 years until operational, in order to get ExCo approval and appoint Operating Agent. Annex proposal sometimes preceded by an ExCo project on the topic.
Task length	Tasks tend to last for 2-4 years and, in recent years, have tended to continue for multiple phases.	One-year Annex preparation phase and, typically, a three-year operational phase. Extensions are rare and limited to one year.	Once operational, Annexes tend to remain in place for renewable five-year periods mirroring the TCP's terms.

The 4E model is similar to the DSM model to the extent that the costs of the Operating Agent are shared by the participating countries. In the 4E model, the participants manage the Annex, its projects and the Operating Agent. This is a more hands-on approach to Task operation than in DSM. The 4E annexes are all focussed on broad topics that warrant on-going international collaboration between governments, and operate in a similar way to the TCP as a whole. The ExCo funding of exploratory projects that can lead to Annex proposals is an interesting innovation.

The EBC model is different to the DSM model in that the Operating Agent costs are not shared; each Annex is supported by an Operating Agent from one of the participating countries. Annexes usually involve a number of sub-tasks, each of which has a sub-task lead, provided by one of the participating countries. EBC Annexes tend to involve collaboration between academics; significant weight is placed on the dissemination plan in the guidance to Operating Agents drawn up by the ExCo. Operating Agents manage the Annexes and require significant funding to deliver against their responsibilities. There is no expectation of second phases of Annexes.

Both of these models could be employed in the DSM TCP, or elements of these structures could be applied to the existing DSM model. As new ideas for Tasks are considered, all options for Task structure should be considered.

EMPOWERING AUTOMATION

Motivation

As decarbonisation drives uptake of distributed energy systems with intermittent supply, the need for rapid demand side response increases. Without automation, markets will not be able to combine the benefits of DSM in energy management (wholesale markets) with the fast acting response needed to manage the changing physics of the network.

However if implemented poorly, automation can fail to provide whole energy system benefits and can disempower consumers, leading to low uptake of energy management systems in homes, offices and industry. In liberalized energy markets automation of DSR will be opt-in, and so must deliver customer value as well as network benefits.

This Task proposes to collate global best practice, and identify key emerging research in social sciences, technology and policy to empower consumers and deliver network benefits. As automated DSR increases, governments and industry participants will need to ensure wider network, environment, and social benefits are met and with appropriate safety nets.

The energy industry is yet to develop a “Social Licence to Operate” DSM systems in an automated way that passes through the maximum value from utilities to customers. This Social Licence to Automate in the energy sector is an extremely difficult challenge for DSM and will require shared insights and lessons from around the world.

Context

Global drivers: Decarbonisation leading to decentralised intermittent supply requiring demand side response in increasingly close to real-time.

DSM Strategy alignment: Focus on consumer empowerment and social equity in the design of hardware and algorithms providing automated DSR.

Cross-TCP linkages: ISGAM; 4E; EBC.

Who are the global leaders?: From start-ups to majors working in the home energy management and connected grid services spaces. Research organisations such as the UK Energy System Catapult; ...

Why us? Global Regulatory focus and best practice promulgation

Why now?: Smart metering, IoT, Move to half-hourly pricing, rapid uptake of solar, etc

Which of us?: Aust.; UK; USA; DE; Canada; EU; China; ...

Aim and objectives

- Create country profiles
 - Industry/society readiness for automation of energy flexibility
- Regulatory, industry and societal context [e.g. profiling of the current state of the sector and identify required changes]
- Existing policy, regulatory or institutional interventions [e.g. documenting and evaluating contemporary examples]
- Map major trials in each country [e.g. detailed case studies exploring the internal dynamics of how new practices are being supported, maintained and replicated]
- Energy literacy
 - Investigate how policy makers, institutions and most importantly customers in various markets understand how energy markets work and how automated “energy flexibility” would be incorporated
- The Customer Algorithm
 - Map customer needs for DSM automation Algorithms
 - Compare existing tools to customer needs (based on peer-to-peer observatory
 - Understand how technology can enable the Social Licence to Operate
- Share the similarities and differences between countries regarding the influences on above [e.g. opportunity for learning from others based on a different local, regional contexts etc]

Approach (Sub-tasks)

- Country profiles on transition readiness and energy literacy regarding benefits of automated DSM
- Whole systems benefits: ‘Requirements reflection’ of energy system needs to consumers in ways they understand.
- Development of a common framework for creating a social license to operate for automated demand flexibility technology and regulations.

Expected outputs

- Reports that capture above
- Recommendations and International insights to help guide policy, regulation and social innovation to enable automation of DSM services

GLOBAL OBSERVATORY ON COMMUNITY SELF- CONSUMPTION AND PEER-TO-PEER ENERGY TRADING. Updated concept note

David Shipworth – UCL Energy Institute

Note: Headings marked ‘London’ contain new material since the Bergen ExCo. Headings marked ‘Bergen’ contain the text presented at the Bergen ExCo.

Context – London

Since Bergen the DSM TCP has undertaken a major review of its workplan and strategic direction. The proposed Task remains within the remit of the emerging Vision and Mission and statements of the TCP and has a strong focus on socio-technical aspects of the energy transition. The review has also highlighted the need for a more flexible approach to Task structure – complementing the existing Cost-share model of the DSM TCP, with Task-share models similar to those undertaken in the EBC TCP (and others). The existing Implementing Agreement of the DSM TCP explicitly supports Task-share based Tasks, however the DSM TCP has little familiarity with working with this model. This proposed task would operate on a Task-share basis, requiring in-kind contributions of National experts’ time in lieu of cash contributions.

To fund the co-ordinating role of the Operating Agent on the Task, a grant application has been submitted to UKR&I (A UK funding body) to support the work of an Operating Agent. National team members from participating national would then fund their own participation in the Task through existing grants. An additional benefit to the DSM TCP will be learning-by-doing of Task-share models through this Task.

At the European level, Community self-consumption is a right now being enshrined in European law through the redrafting of the EU Renewable Energy Directive.

“Member States shall ensure that renewable self-consumers, individually or through aggregators, are entitled to: (a) generate renewable energy, including for their own consumption, store and sell their excess production of renewable electricity, including through power purchase agreements, electricity suppliers and peer-to-peer trading arrangements...”

Community self-consumption describes both a set of trading arrangements enabling customers to engage in the energy market, a cluster of enabling technologies (including smart metering, generation, storage, energy management systems), and a regulatory environment supportive of both greater customer participation in the energy system and development of distributed balancing services for enhanced grid asset utilization.

Because the term ‘Community self-consumption has been used by the EU, this has been reflected in the extended title of the proposed Task.

Context - Bergen

This proposal draws on the work in the Draft Strategic Work Plan, particularly the section under 'Emerging technology case studies'.

It is a proposal for a 'Global peer-to-peer observatory'. This will identify and examine existing and emerging demonstration and real projects in peer-to-peer energy trading throughout current and accession IEA member countries. It will have a substantial focus on the policy and regulatory enablers and constraints to the application of this technology in the context of the business models and technology clusters deployed. It will be complementary to activities across the existing tasks of the DSM TCP and will seek approval of, and report into, ISGAN Annex 2.

This work is complementary to work now being instigated by the Digital Single Market Directorate, DG CONNECT, European Commission through which a European Blockchain Observatory has been established. While this is tracking developments in all applications of blockchains – what is proposed here is focused on peer-to-peer energy trading. While much of this will make use of distributed ledger technologies – it is not limited to this class of technologies. These initiatives are complementary and would seek to work together.

Objectives in the context of the DSM TCP

- A targeted activity - focused on a specific application of an emerging technology with substantial behavioural sensitivities and with potential global impact.
- A cross-cutting activity - designed to complement existing DSM Tasks. Drawing from, and feeding into, the work of Tasks 17, 24 and 25.
- A strong policy and regulatory focus - identifying those factors acting to support uptake and deliver defined policy benefits.
- A strong analytical component - applying Systematic Review methods to identify common traits in the literature, and using Qualitative Comparative Analysis to draw generalised lessons from an international population of case studies.
- A multi-disciplinary case-based activity – focused on integrating from insights from analysis of all aspects shaping adoption and uptake of peer-to-peer models.
- A user-centred design activity – where the user is the policy maker/regulator. Elicitation of policy makers' evidence needs and policy epistemology.
- A IEA Global Exchange Platform activity - Outputs tailored for adoption on this platform.

Brief introduction – London

On 14 June 2018 the European Council amended the Draft Renewable Energy Directive to enshrine the right of European citizens to renewable self-consumption including peer-to-peer energy trading – a significant regulatory milestone. 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 directly between participants or indirectly through a certified third party market participant, such as an aggregator.”(p.55)

Moreover, Article 21 of the same draft Directive says:

“Member States shall ensure that renewable self-consumers, individually or through aggregators, are entitled to generate renewable energy, including for their own consumption, store and sell their excess production of renewable electricity, including through power purchase agreements, electricity suppliers and peer-to-peer trading arrangements...” (p.94)

<Ref: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_10308_2018_INIT&from=EN>

At the time of this writing the draft Directive is still subject to ratification, however substantive changes are unlikely at this stage, making this a substantial legislative step to making peer-to-peer energy trading

a reality for the European Union's 500 million citizens.

In advance of the above directive, France, Germany, Austria, Luxembourg and Spain have changed or are changing their laws to support community self-consumption. In addition to changes in EU law, China is implementing peer-to-peer trading mechanisms within its regions, and other nations such as Australia and New Zealand are already well advanced in piloting schemes. In the UK a range of pilot projects are already underway through the Ofgem Regulatory Sandbox, Elexon have published a white paper implementing peer-to-peer under the Balancing and Settlement Code structure, and the CEO of Ofgem, Dermot Nolan, is on record as saying that "One of the most exciting new business models involves peer to peer trading of energy."

While many of the practical applications of these 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 research. Internationally, universities such as Tsinghua (China); MIT and Stanford (USA); KIT and ESMT (Germany); Panthéon Sorbonne (France); Universidad EIA (Colombia); EUI (Italy); Curtin (Australia) and many others have growing teams of researchers working on community self-consumption. This covers associated technologies from energy systems components, to cryptography, to regulatory reform, to understanding the wider societal impacts. The UK is also very active in this field, with Imperial, Bristol, Newcastle, Strathclyde, Oxford, Cardiff, Warwick, and UCL all researching applications in this space and Ofgem recognized as a leader in energy regulatory innovation.

Brief introduction - Bergen

Peer-to-peer energy trading is rapidly emerging as a potential solution to a range of challenges poised by the energy transition. The energy transition is closely studied and well documented in recent IEA publications. 'Tracking Clean Energy Progress: 2017' lists the macro drivers, noting four key technologies are on track to deliver the 2°C goal of the Paris climate accord namely electric vehicles, energy storage, solar PV, and onshore wind. The International Renewable Energy Agency (IRENA) reports that the majority of capacity and investment in the global power sector in the last four years has been in renewable energy, with over 60% of investment being in renewables in the last 12 months. The economic opportunities this transition creates are considerable, with the World Economic Forum having estimated them at "... more than \$2.4 trillion of value from the transformation of electricity over the next 10 years." Much of the value is being liberated through 'digitalisation'.

One of the key findings of the recent IEA report 'Digitalisation & energy' noted that "Investment in digital electricity infrastructure and software grew over 20% annually between 2014 and 2016, overtaking global investment in gas-fired power generation." (p.26). Digitalisation primarily refers to the creation of metering and control systems able to monitor and manage the complex bi-directional flows over smart grids. Several Technology Collaboration Programmes of the IEA are active in evaluating and facilitating research into the enabling technologies of the energy transition. ISGAN has played a global role in coordinating policy learnings on smart grids, EBC has extensively addressed generation asset integration at the building and community scale, and DSM has addressed this issue in multiple tasks. Phase 4 of DSM Task 17 on the Integration of Demand Side Management, Energy Efficiency, Distributed Generation and Renewable Energy Sources is directly addressing Responsive Prosumer Networks; DSM Task 24 on Behaviour Change in DSM has analysed behaviour change in relevant case-studies; and DSM Task 25 on Business Models for DSM Energy Services has assessed business model characteristics applicable in the field.

The IEA has highlighted the potential role of peer-to-peer in two major recent reports: 'Digitalisation & energy', and 'Prospects for Distributed Energy Systems in China'. Both of these highlight the potential

role for peer-to-peer in the context of distributed energy systems management and the balancing of bidirectional flows of energy between producers and consumers at the grid edge. Making this work as a market requires a transaction layer that can reduce the transaction costs to near zero. Developments in distributed ledger technologies, such as blockchains, are now making this possible. This is echoed in recent reports from the World Energy Council which conclude that "...blockchains seem to hold the key to an internet of things in energy with a promise of revolutionary system benefits." (World Energy Issues Monitor 2017)

It now seems highly likely that such local energy trading models will form a component of energy management in the global energy transition. In this context, an IEA TCP activity stream tracking the global development of this technology cluster seems justified.

Motivation - Bergen

Peer-to-peer energy trading can deliver a wide range of different social, economic, technical, and environmental benefits depending on how the schemes are designed. Policy makers and regulators in different regimes need to understand how the architecture of peer-to-peer schemes determines the outcomes they wish to achieve. They also need to understand the potential distribution impacts of such schemes to ensure that they do not generate any consequent adverse social or energy systems impacts beyond the boundaries of the scheme.

Project developers need to understand the factors that lead to successful uptake of schemes in different contexts, and in particular how the social, technical and regulatory regime will impact on the design of their project. They need the opportunity to work in a pre-competitive environment with others, including scheme developers, technology suppliers, energy suppliers and regulators to maximise mutual learning and identify developmental pathways that meet the requirements and constraints of all parties.

Researchers, in academic institutions, NGOs, and other non-commercial bodies, need to a forum within which they can collaborate internationally. They need to demonstrate a route to impact of their work, and use the prestige and impact of the IEA to can be used to increase their likelihood of receiving national funding. They also need to identify commercial organisations and regulators to work with to develop their trials.

Aim and objectives - London

- Lead global knowledge sharing through establishment of the preeminent policy and regulation focused global research network on community self-consumption and peer-to-peer energy trading.
- Create a global framework 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 community self-consumption and peer-to-peer energy trading in different regulatory regimes.
- To conduct a systematic, OECD wide, study of the relationship between the design of community self-consumption energy retail market structures and energy policy outcomes.
- To identify the factors leading to successfully uptake of community self-consumption and peer-to-peer models in different contexts, and embody these in a globally recognised 'Readiness Index' feeding into the IEA and the Clean Energy Ministerial
- To develop a global community of researchers and practitioners working on peer-to-peer within a pre-competitive environment to share best practices and inform the development of policy and regulation.
- To bring new countries and companies into the DSM TCP
- Produce policy relevant outputs for the IEA Global Exchange Platform.

Approach – Bergen

The work will consist of the following elements:

A systematic review of existing literature on peer-to-peer energy trading. This will cover the academic literature and grey literature, and will apply a theory-driven systematic review framework (Pawson & Tilley 1997). While outside the scope of the formal systematic review, alternative media sources such as podcasts, video, and social media will also be drawn upon. This work will be complemented where appropriate with use of expert elicitation (O'Hagan 1998) to help develop a more complete picture of developments in this rapidly changing field.

A set of global case studies of peer-to-peer energy trading. These will be conducted in all participating member states through primary field-work, and in non-participating states through secondary sources and interviews with participants where resources allow. 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.

A synthesis of findings from these case studies. More general findings will be derived through application of the Qualitative Comparative Analysis of the multiple case studies. 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 cases regulatory or social environments.

As the number of cases develop, and the evidence base becomes more complete, the QCA will be used to develop graphical probabilistic models. These models have been used in many complex socio-technical areas to draw together the influence of different factors on the success of projects. They have an extensive history in areas like water and land resource management allowing integration of regulatory, social, environmental and technical factors into a single model of project outcomes. Over time, such models can start to quantify the likely scale of scale of consumer response, and to link the theoretical causal models implicit in them to users stated social values. It will compare these with current policy and regulatory objectives including factors such as energy market participation, affordability, distributional impacts, climate change mitigation, air quality improvement, and fuel poverty alleviation.

Research methods:

Theory-driven systematic review (Pawson & Tilley 1997). Systematic evidence review methods (Grant and Booth, 2009). Expert elicitation (O'Hagan 1998); graphical probabilistic modelling (Jensen 1996).

Expected results – Bergen

Expected outcomes

- A systematic review of the factors governing successful implementation of peer-to-peer energy trading in participating member states.
- A suite of case-studies of pilot or commercial peer-to-peer energy trading trials across the major world markets where they are being deployed. These will be written up in a standard format developed in conjunction with the IEA's Global Exchange Platform to ensure consistency of data gathered across cases, as well as the policy, regulatory and commercial relevance of the outputs.
- An International Qualitative Comparative Analysis of case studies across all participating countries to identify common success factors for deployment of peer-to-peer.
- Development of quantitative graphical statistical models of the comparative influence and interaction between factors governing uptake of peer-to-peer.

- Establishment of an international community of researchers willing to share learnings on peer-to-peer energy trading in a pre-competitive collaborative environment.
- Development of global metrics for tracking the uptake of peer-to-peer energy trading.
- Introduction of new countries and companies into the IEA DSM family

Ambition outcomes:

- Development of the graphical models in a form that is compatible with existing IEA modelling frameworks.
- Development of the graphical models in a form that is integrable with existing IEA modelling frameworks

Task structure and scale - London

It is proposed that the 'P2P Observatory' operate under a 'Task-share' model. This would mean that participating members of the DSM TCP would not be asked to contribute funding to support the work of the Task Operating Agent, but would be required to commit in-kind resources in terms of identifying national experts. The national experts would serve three key purposes. Firstly, they would provide expert input on the policy and regulatory context in each country. Secondly, they would provide input on what form of Task output would be most readily assimilable into the policy making process in their country. Thirdly, they would provide a route to help adoption and integration of the Task outputs into the policy and regulatory development processes in each country. The success of the task is dependent on the identification and active participation of key policy and regulatory experts in each country so a firm commitment from participating members is sort to ensure this.

It is proposed that the Task would be run by an expert Operating Agent funded entirely through a UK Research and Innovation (UKR&I) grant. An application has been submitted to UKR&I under the Energy Revolution Research Consortium (ERRC) call as part of the Prospering From the Energy Revolution (PFER) Industrial Strategy Challenge Fund (ISCF). The P2P Observatory would be supported by the research undertaken under this call. This call is the subject of one of the presentations at the London ExCo DSM Day. The PFER ISCF is a ~£70M programme of work in the UK looking at the design and implementation of local energy systems – including community self-consumption and peer-to-peer energy trading models. Only a single bid was submitted under this call. The outcome will be known by November 2018 with work starting in December 2018 if successful. There is a risk this will not be funded, however as only a single consortium bid was submitted (as was requested by the funding body), and this bid contains all major UK researcher institutions in this field, it is likely to be funded. The funding application includes a named researcher who would act as Operating Agent for the Task. This is Alexandra Schneiders, an experienced energy lawyer with a background working in the energy sector in Brussels who is actively researching the policy and regulatory aspects of community self-consumption and peer-to-peer energy trading.

Task participants - London

It is currently envisaged that this Task would include teams from eight to twelve countries, each contributing six to ten active participants from Professors to PhD students, as well as potential contributions from consultants and industry. There are expressions of interest to participate from the UK; Ireland; Netherlands; Sweden; Switzerland; France; Germany; Italy; USA; Australia and Colombia, as well as interest from organisations including the World Economic Forum and the Energy Web Foundation along with major corporations. The task is therefore likely to represent the collective work of around 60 global experts collaborating 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.

High-level description of sub-tasks - London

1. Conduct of systematic reviews of existing literature on Community Self Consumption/Transactive energy/peer-to-peer energy trading covering both the academic and grey literature and applying theory-driven systematic review frameworks
2. Development of Theory of Change/Programme Theory frameworks for Community Self Consumption/Transactive energy/peer-to-peer energy trading based building on those developed

- in the ERRC
3. Development of templates for collection of case-study data on Community Self Consumption/Transactive energy/peer-to-peer energy trading pilots in IEA member countries aligned with those developed in ERRC
 4. Develop a variant of the evaluation framework developed in ERRC adapted and developed with the Task's international community into a community self-consumption and peer-to-peer energy trading 'readiness index'.
 5. Conducting bi-annual task meetings in different IEA member countries in which findings from different national teams are presented
 6. Providing support for national teams in the completion of case studies and the reporting of cases in different member countries
 7. Drawing out of common technical, social, political and regulatory factors which support the development of Community Self Consumption/Transactive energy/peer-to-peer energy trading schemes in different countries using the analytical methods described above.
 8. Reporting to bi-annual IEA DSM TCP ExCo meetings on the work of the Task
 9. Reporting to the IEA and providing input to IEA publications and the Global Exchange Platform to maximise impact

Schedule of meetings - London

Because of the alignment of this work with the UKR&I funding through the PFER ISCF, the Task Operating Agent would attend both DSM TCP ExCo meetings, as well as the ERRC consortium meetings.

The Task Operating Agent, ERRC and the WP lead, would need to report to each DSM ExCo Mtg: Attend each meeting of the DSM Task, and attend each ERRC meeting.

To address issues of the need for responsiveness raised by ExCo members in Bergen, the task would run on a three-month reporting cycle, providing feedback to the Member Country expert representatives on a quarterly basis and to the DSM TCP ExCo on a biannual basis.

The following schedule of meetings shows the proposed timings of meetings attended and reported to by the Operating Agent.

- CSC Obs = the DSM Task 'Global Observatory on Community Self-Consumption'
- ERRC Mtg = EnergyREV (ERRC) consortium meeting (quarterly)
- DSM ExCO = the Executive Committee of the Demand Side Management TCP.

2018 = 2 Mtgs

CSC Obs Prep Phase - 2018-10 to 2019-04

CSC Obs Prep.Phase Mtg - 2018-Q4 [2 day meeting in London]

ERRC Kickoff Mtg 2018-12

2019 = 8 Mtgs

DSM ExCo - 2019-04 Start

ERRC Mtg. 2019-03

CSC Obs Kickoff Mtg - 2019-05

ERRC Mtg. 2019-06

ERRC Mtg. 2019-09

DSM ExCo - 2019-10

CSC Obs Mtg - 2019-11

ERRC Mtg. 2019-12

2020 = 8 Mtgs


ERRC Mtg. 2020-03

DSM ExCo - 2020-04

CSC Obs Mtg - 2020-05

ERRC Mtg. 2020-06

ERRC Mtg. 2020-09



DSM ExCo - 2020-10
CSC Obs Mtg - 2020-10
ERRC Mtg. 2020-12

2021 = 8 Mtgs

ERRC Mtg. 2021-03
DSM ExCo - 2021-04
CSC Obs Mtg - 2021-05
ERRC Mtg. 2021-06
ERRC Mtg. 2021-09
DSM ExCo - 2021-10
CSC Obs Mtg - 2021-11
ERRC Mtg. 2021-12

2022 = 6 Mtgs

ERRC Mtg. 2022-03
CSC Obs Mtg - 2022-04
DSM ExCo - 2022-04 End
ERRC Mtg. 2022-06
ERRC Mtg. 2022-09
DSM ExCo - 2022-10 Final report.

Matters for the ExCo

The Task proponents seek permission of the ExCo to enter the Task Definition Phase. This would run between October 2018 and April 2019. Those members wishing to participate would need to identify and commit in-kind contributions from relevant national experts, which would attend a preparatory phase meeting of the Task.

A fully developed proposal would then be brought to the April 2019 ExCo for final approval.

Document H



NEW TASK PROPOSAL: LOW CARBON COOLING

Introduction and context

Effective cooling is essential to preserve food and medicine. It underpins industry and economic growth, is key to sustainable urbanisation as well as providing a ladder out of rural poverty. With significant areas of the world projected to experience temperature rises that place them beyond those which humans can survive, cooling will increasingly make much of the world bearable – or even safe – to live in. Studies suggests that if climate change is not checked, significant parts of the world will suffer heatwaves beyond the limit of human survival by 2070.¹

Globally, we will demand far more cooling in the decades ahead. As one example, alongside the rapid growth in demand for comfort cooling, consumption of high nutrition foods in India is expected to touch half a billion tons by 2030; connecting the supply of such foods with consumers leaves only one healthy recourse - the 'cold-chain'. In fact, over the next 30 years we are projected to see 19 cooling appliances (air conditioners, fridges, mobile refrigeration units, chilled display units in our shops) deployed somewhere in the world every second; by 2050, there could be more than 9.5 billion cooling appliances worldwide – more than 2.5 times today's ~3.6 billion.²

The environmental focus with regard to cooling equipment to-date has been largely on the issue of the impact of synthetic refrigerants on the Ozone Layer and Climate Change (Montreal Protocol, Kigali Amendment). However according to United Nations Environment Programme (UNEP), more than 80% of the global climate impact of RACHP (Refrigeration, Air Conditioning and Heat Pumps) systems is associated with the greenhouse gas emissions of the electricity generation required to power the cooling appliances.

¹ www.nature.com/articles/nclimate2833

² To reference data in this note please see www.birmingham.ac.uk/Documents/college-eps/energy/Publications/2018-clean-cold-report.pdf

We are seeing the incremental development of more efficiency cooling technologies. But the growth of artificial cooling will create massive demand for energy, as much as 9,500TWhs annually and, unless we can reduce our need for cooling and roll out solutions for clean and sustainable cooling provision, this will cause high levels of CO₂ and pollution.

Under these projections, much of the world would still only have low penetration levels of cooling. We would still have high levels of food loss, a significant percentage of the world's population in the hottest regions of the world without cooling, and medicines and vaccines spoiled in the supply chain. For example, even by 2050, AC and refrigeration equipment penetrations in parts of Asia and Africa will likely only be 10-20% of those experienced in the USA today.

A recently published [analysis](#) led by the University of Birmingham suggests that if we are to deliver access to cooling for all with no-one left behind, by 2050, the world could require 14 billion cooling appliances globally - four times as many as are in use today, and 4.5 billion more than current global projections for 2050. This would see the cooling sector consume up to 19,000TWh per annum; five times the amount of energy it does today.

The world must not solve a social crisis by creating an environmental catastrophe; we need to ensure access to affordable cooling with minimum environmental impact and maximum efficient use of natural and waste resources.

Motivation

Analysis of a range of scenarios for future cooling demand indicates that anticipated equipment deployment and operations trajectories will result in a substantial growth in electricity demand, challenging supply infrastructure arrangements, and energy budgets for cooling provision, as implied by the GHG emissions reduction targets of the Paris Climate Change Agreement, being exceeded significantly.

To avoid this CO₂ emissions outcome without radically reducing energy consumption would require very substantial expansions in the global capacity to generate electricity from renewable energy sources. Some of the increases in cooling capacity required may further shift the grid mix in affected countries to much higher penetrations of renewables than would otherwise be required. In the most extreme case a doubling of the currently anticipated renewable energy sourced generation capacity by 2050 could be needed, which would have enormous infrastructure cost implications.

Whilst existing initiatives to improve average levels of cooling device efficiency will go some way towards addressing this challenge, optimistic projections produced by the Green Cooling Initiative (an alliance of key players in the RAC sector and comprises government institutions, international organisations and the private sector), the most comprehensive data set available to date, suggest that a ~30% reduction may conceivably be possible for current commercial technologies but with significant cost implications. More radical interventions will be needed to keep energy demands from cooling equipment and systems within the energy budget implied by internationally agreed carbon allowances (Paris Climate Agreement).

These interventions are likely to necessarily include demand reduction by influencing consumer behaviour, as well as a range of clean cooling technologies and approaches, including amongst others taking a whole systems design approach to cooling loads; much greater use of district or community cooling to harness free cooling (such as bodies of water) or waste heat, use of thermal energy storage. It is likely that a significant amount of energy storage will be required to integrate and manage cooling demands with renewable resources and the deployment of more disruptive, energy efficient technologies.

Low carbon cooling necessarily must be accessible, affordable, financially sustainable, scalable, safe and reliable to help deliver our societal, economic and health goals. Market stakeholders have identified barriers to both behavioural change and cooling equipment uptake that relate to awareness, affordability, financing, culture/ consumer attitudes, policy priorities, electricity availability, technical capability and skills as well as national interest, lack of innovation and an inadequate evidence base.

Aims and objectives

Low carbon cooling must start with what we can do today to reduce demand by influencing customer behaviour; from temperature settings for our air conditioning to more effective use of shade and natural ventilation in building design, painting roofs white and putting doors on chillers in supermarkets through to installing best-in-class refrigeration and air-conditioning equipment.

Equally, if cooling provision is to be sustainable and properly integrated renewable energy, we need not only more efficient air-conditioners and fridges, but also a fundamental overhaul of the way cooling is provided – a new needs-driven, system-level approach. This will necessitate the integrated development of energy resources, devices, systems and skilled people for deployment in key market sector environments. This in turn will require new value and business models to be adopted, as well as end user take-up of disruptive solutions.

Research work has demonstrated the important influence that contextual issues such as individuals and organisational attitudes and behaviours, as well as cultural and market conditions and business models can have on the adoption of low carbon technologies and energy efficient practices both with regards to cooling as well as other sectors

Globally we have an aspiration to deliver a sustainable, low carbon and environmentally friendly economy. However, the current policy landscape governing the environmental impact of cooling is under-developed at both a supra-national and national level.

Challenge 1:

We have become profligate with cooling with little understanding of its energy and environmental cost. As we migrate from fossil fuels to renewables, we need to radically reshape the cooling landscape; combining technology, operations, financing, and consumer behaviour in a system perspective.

Challenge 2:

Although the enormous potential of cooling and refrigeration to help achieve energy targets for diversification, decarbonisation, efficiency and greenhouse gas emissions, the public and political awareness of these energy-intensive technologies is still insufficient. Most sectorial analyses spotlight heating, whereas cooling is mentioned just pro forma for linguistic symmetry.

Key areas of research

We plan to look at methodologies and their barriers and incentives to:

- Reduce cold load/cooling work required by demand reduction - doors on supermarkets, building design, temperature settings for air conditioning; capex is the primary determiner of technology choice rather than energy efficiency and whole of life cost
- Reduce the energy required for cooling: *getting consumers to adopt high efficiency cooling technologies and where appropriate manage the rebound effect (see note below)*
- Role of Artificial Intelligence (AI) and data to better manage cooling systems and drive maintenance to deliver performance.
- District and community system level thinking across built environment and transport and the

role of thermal energy storage.

The rebound effect – one behavioural consideration is the need to take into account unmet or “latent demand” for thermal comfort, such that improvements in energy efficiency from better equipment that may result in greater use of air conditioning and consequently less-than-expected reductions in electricity requirements. A programme in Mexico between 2009 and 2012 encouraged replacement of inefficient refrigerators and air conditioners more than 10 years old through rebates and consumer financing. While the programme successfully replaced 167,000 ACs, a rebound effect led to increased energy consumption and higher energy bills for people, as the lower hourly operating costs encouraged increased operating hours, reflecting unmet demand for comfort. Unintended consequences of programmes like these will need to be anticipated and accurately assessed and mitigated for when considering costs and benefits.

Some key areas we shall explore include:

- purchasing decisions (price vs. efficiency);
- wrong specification;
- building design practices;
- maintenance in commercial environments;
- operating practices (in domestic environments) e.g. defrosting, whether food that is in refrigerators needs to be refrigerated etc.;
- operating practices (in commercial environments) e.g. set points, not using night blinds, leaving drinks fridges on overnight, cooling offices that no one is sitting in, poorly set up BMSs etc.;
- customer responses in retail environments (e.g. fridge doors);
- use of sensors and data;
- thermal storage.

Approach

- Given the global growth of cooling but also the different needs, cooling priorities, energy systems and challenges of different countries and markets, we would propose looking at a spread of countries. This would allow us to define the specific priorities, barriers and drivers, with case studies, within three or four markets, and to identify any common themes.
- Research will include a combination of literature reviews, investigative research, workshops / marketing testing.
- A PESTLE analysis framework will be used (political, economic, social, technological, legal, environmental) to analyse and monitor the factors that are likely to facilitate or create barriers to demand-side management.

Tasks

PHASE 1

Sub-task 0 Set-up of the task and administrative aspects

Engage research team;
Define the vision, scope, objectives, schedule and resource budget;
Administrative and management activities to provide oversight of the programme’s activities, progress, quality, risks and accomplishments;
Ensure periodic reporting as agreed with the ExCo.

Sub-task 1 Literature review

Review of relevant literature and research to quantify and score the key demand-side management initiatives against a key matrix of targets – cost, time, energy impact and

perceived barriers – across a range of countries and markets.

Review of relevant literature and research as it relates to behaviours, socio-technical transitions and organisational responsiveness to the adoption of renewable energy and other low carbon and energy efficient technologies and practices, especially where relevant to the cooling sector.

Sub-task 2 Investigate research – case studies

Based on defined areas of impact on energy consumption for cooling, review (including in-depth interviews with key stakeholders) a spectrum of specific cooling projects (demand reduction and new technology deployment) across a range of applications and markets to understand uptake successes and failings as they relate to behaviour and socio-technical transitions and organisational responsiveness to the adoption.

Sub-task 3 Energy profiles and national policies –

The potential deployment trajectory of technology will be heavily dependent on the evolution of the energy system and policies with the increasing penetration of variable renewables, tightening of emissions and introduction of other new demand-side technologies (such as electric vehicles). We will assess the policy and regulatory barriers that could prevent the technology from being deployed cross referencing the case studies with an analysis of national energy supply profiles, pricing and carbon footprints; installed renewable energy supply and capacity and renewable energy economic, regulatory and policy drivers. We will focus on analysis of the three countries but look to how representative other countries may be similar to, or different from, these case studies.

Sub-task 4 Industry engagement

Cross-reference the case studies with a cross-section of industry innovators (OEMS/Tier 1/Tier 2s and start-ups) to understand their perceived barriers or drivers for uptake.

Sub-task 5 Develop and evaluate alternative business strategies and policies

Consider concepts aimed at overcoming contextual barriers and increasing uptake of demand side reduction measures, initiatives or programmes.

Sub-task 6 Market test alternative business strategies and policies

Workshop events in each participating project country will be used to engage a wider set of stakeholders from our findings.

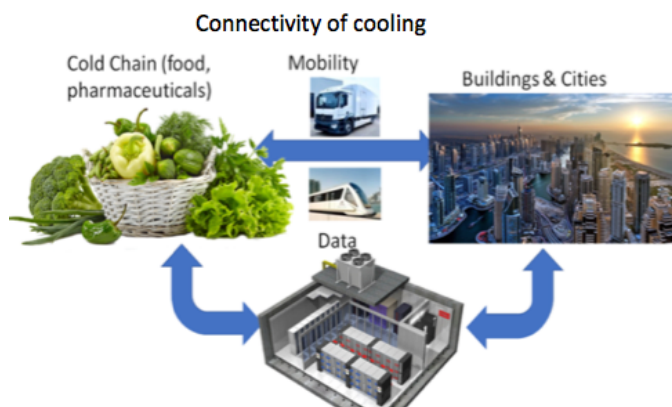
Sub-task 7 Knowledge transfer

Identify optimal means directly and through third parties to disseminate outputs; to include conferences, academic paper and report.

Expected Results

The deliverables of this research project are expected to be

- cost-impact analysis of when and where demand-side management (behavioural change as well as technology) would be most valuable at the energy system level to lower carbon intensity in a number of different countries and markets;
- identify non-technical barriers, incentives/enablers to behavioural *and* technological change to low carbon cooling solutions which can then inform the development of strategies designed both to remove or overcome the blockages and encourage and diffuse helpful practices;
- examine the role that alternative business strategies and models have to play in delivering transformative technology and behavioural change and in increasing its market uptake;
- define policies build awareness for, stimulate and properly reward low carbon cooling, both in (i) reducing our demand for cooling and (ii) adopting more efficient or radical technologies.



The project will also provide an informed platform to better analyse national and local policies in cooling specifically including

- The interconnection of cooling in energy, industry and transport, and the role governments can play in promoting renewable and free/waste energy for cooling demands within that system.
- The policies required to enable successful uptake of thermal energy storage and 'cold and power' technologies, as enablers of an increasingly decarbonised energy grid.

In support demand-side management strategies to decarbonising cooling as a key part of climate change mitigation, it will also support:

- Building a knowledge based economy and green talent for cooling
- Advancing economic diversification through innovation

Outputs

- Evidence based cost-impact analysis of demand-side interventions to help deliver low carbon cooling;
- Report on the incentives and barriers to uptake;
- Alternative business strategies and models;
- Policy recommendations;
- Dissemination materials;
- Conference at University of Birmingham.

Matters for the IEA DSM ExCo

- Consideration of the rationale, aims and objectives of this research proposal?
- Which countries might be interested in participating (through the provision of financial and/or in-kind (e.g. experts) contributions)?
- If there is interest from the ExCo for the University of Birmingham to progress this project with Professor Toby Peters as the proposed Operating Agent? Commencing with sub-task 0, we shall produce a full proposal for the next ExCo.

Resources required

This multi- and inter- disciplinary research project would be led by Professor Toby Peters as the proposed Operating Agent, supported by a full-time Postdoctoral Research Assistant. We would allow 12 months from

commencement to include project establishment, full research, report writing and preparation of dissemination materials.

We would ask for a contribution of £130,000 towards salaries and overheads for 12 months, + travel / subsistence (dependent on country selection), as well as to fund workshops, the writing, design and production of a report, appropriate website pages and a conference to present the findings.

Toby Peters is the Professor of Cold Economy at the University of Birmingham and a Fellow of the University's Institute for Global Innovation. He is also a Senior Research Fellow in Transformational Innovation for Sustainability at Heriot-Watt University; Senior Advisor, Cooling to Sustainable Energy for All, and Chair, Academic Mirror Group, CoolingEU.

He is one of the inventors of Liquid Air Energy Storage and Cryogenic Energy Storage for clean cold and power, and the architect of the "Cold Economy". He has created and leads much of the new system-level approaches and research around delivering environmentally and economically sustainable cooling and power in both transport and the built environment, and the role "clean cooling" has to play in emerging market transformation, including sustainably addressing post-harvest food loss in developing economies.

The Birmingham Energy Institute is the focal point for the University and its national and international partners to create change in the way we deliver, consume and think about energy. The Institute harnesses expertise from the fundamental sciences and engineering through to business and economics to deliver co-ordinated research, education and the development of global partnerships.

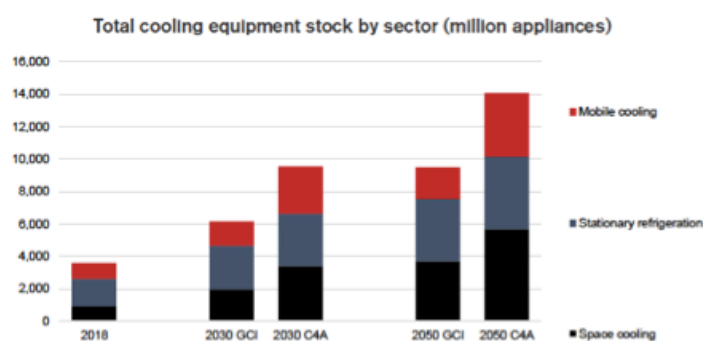
The Institute for Global Innovation at the University of Birmingham supports and delivers world-leading, multi- and inter- disciplinary research that seeks to address some of the world's most pressing challenges that affect humanity at a global level.

Appendices

1. GROWTH IN COOLING: DEMAND, ENERGY USAGE, CO₂ EMISSIONS
2. EXAMPLES OF POTENTIAL DEMAND-SIDE INTERVENTIONS OF COOLING
3. EXAMPLES OF BARRIERS TO DEPLOYING EFFICIENT TECHNOLOGIES AND DSM FROM PREVIOUS RESEARCH
4. THE BIG EXAMPLES: HOW A LACK OF ACCESS TO COOLING FOR HUNDREDS OF MILLIONS OF PEOPLE MEANS THAT THEY ARE UNABLE TO MEET VERY BASIC NEEDS
5. ARTIFICIAL COOLING

Appendix 1: Growth in cooling: Demand, Energy Usage, CO₂ Emissions

DEMAND FOR COOLING



According to National Grid scenario modelling, the number of domestic air conditioners in the UK country could soar from negligible today to 20 million by 2050, with enormous impacts on the electricity grid. They would consume 11TWh of electricity per year – equal to the current total consumption of Estonia - but cause peak demand on a summer weekend afternoon to triple from under 20GW today to over 70GW.³

So extreme is the projected impact of domestic air conditioning that Britain will become a 'twin peaks' electricity system, with both a traditional winter late afternoon peak and a summer afternoon peak – making it harder for electricity generators to shut down power stations in summer for maintenance. Solar power will offset some of the increase but far from all of it, since the solar peak comes at midday rather than the end of the afternoon when temperatures are highest. Britain is far from unique, however.

Today, heating and cooling account for half of the EU's energy consumption. While the current demand for cooling is lower than its heating counterpart, it is going to increase rapidly in the upcoming decades; in fact a 70% increase in the cooling needs of the European building sector is expected by 2030.⁴ Netherlands Environmental Assessment Agency projects that globally, by 2060, we are projected to consume more energy for cooling than heating. By the end of the century air conditioning could consume around half the electricity generated worldwide for all purposes in 2010.

While the Internal Space Cooling sector is expected to grow the fastest, with the number of appliances in use quadrupling between now and 2050, in parallel, the equipment stock in both the Stationary Refrigeration and the Mobile Cooling sector equipment stock could almost double.

ENERGY CONSUMPTION OF COOLING

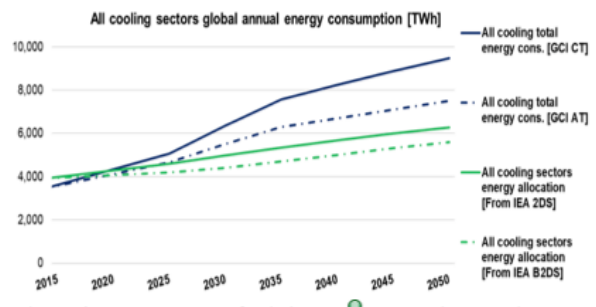
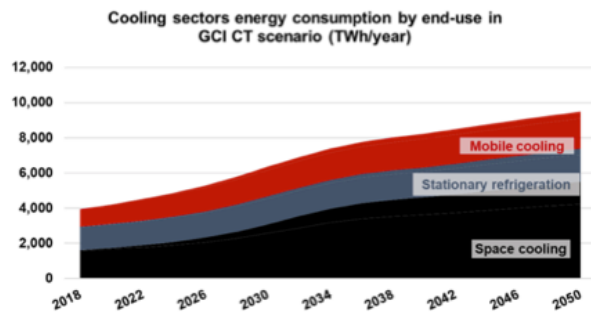
Cooling is energy intensive.

We are seeing the development of more efficient cooling technologies, but even allowing for these and other more aggressive energy mitigation strategies, the cooling sector will, on current trajectory, increase its overall energy consumption by 90% by 2050 to ~7,500TWh annually compared with 2018 levels (3,900TWh); and potentially 9,500TWh if we do not achieve the best current projections aggressive energy efficiency strategies.

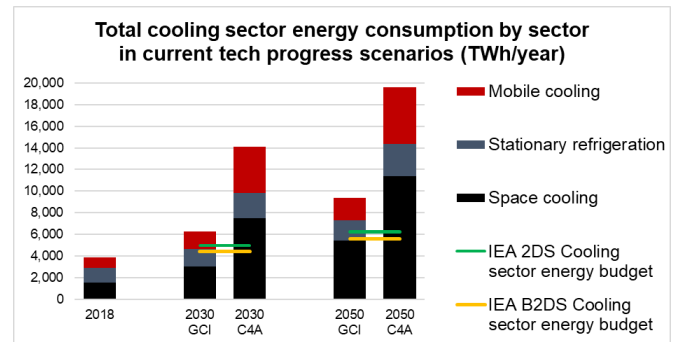
³ <http://fes.nationalgrid.com/media/1290/ac-2050-v212.pdf>

⁴ coolingeu.eu/role-of-cooling/

This scenario (9,500TWh) still assumes equipment energy consumption reducing (on average, between 2018 and 2050) by 15% in space cooling and 38% in stationary refrigeration (no reduction in mobile cooling equipment energy use).



If we consider the impact of delivering accelerated cooling equipment uptake to meet the Cooling for All objectives with equipment energy efficiency following a business as usual trajectory, the extremely rapid growth in equipment stocks leads to an explosion in energy use across all sectors – up to 19,600 TWh by 2050 (i.e. more than double the current worst case projections).



Without radical intervention, ‘greening’ this volume of electricity could consume the world’s projected renewables capacity in 2050. Radical intervention means a reduction of around 70% in electricity usage for cooling. Optimistic projections produced by Green Cooling Initiative, the most comprehensive dataset available, suggest around 30% may be possible, but with significant cost implications.

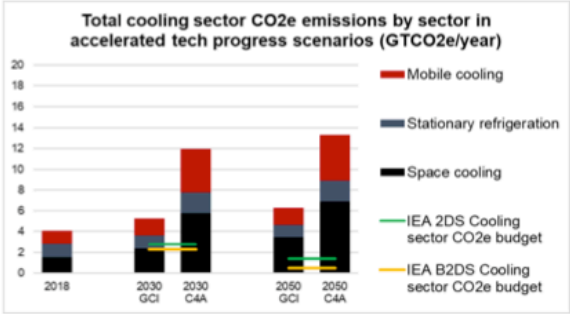
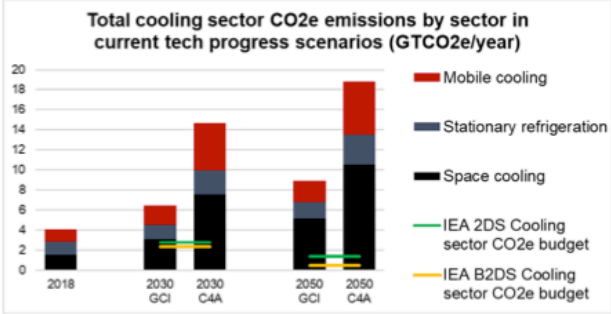
Scenario	% of IEA RTS projected renewables capacity by 2050	% of IEA 2DS projected renewables capacity by 2050
Current Technology Progress	49%	33%
Accelerated Technology Progress	39%	26%
Cooling for All - Current Technology Progress	101%	68%
Cooling for All - Accelerated Technology Progress	80%	53%

Cooling - CO₂ Emissions

Even at current levels of demand, the global provision of cooling is responsible for high levels of greenhouse gas (GHG) emissions, as well as other forms of pollution such as NO_x and PMs that impact on air quality. In fact, compared to that of the aviation and maritime sectors combined, cooling already has double the global carbon dioxide (CO₂) related impact on the environment, and demand for cooling is growing rapidly.

If electricity continued to be produced with the current energy mix⁵, and cooling equipment energy efficiency followed the current technology trajectory, CO₂e emissions from the cooling sectors would grow from 4.1 GTCO₂e today to more than 8.9 GTCO₂e by 2050 – of which CO₂e emissions tied to energy use alone would account for 7.4 GT. This is an additional 6 to 6.9 GT compared to the CO₂ emissions budget⁶ implied by the IEA’s 2DS and 2BDS energy trajectories from ETP2017 of 0.5 to 1.4 GT of CO₂ respectively.

If we achieve the societal goal of delivering ‘Cooling for All’, the cooling sector’s total CO₂e emissions grow (to 18.8 GTCO₂e. Even allowing for best case current equipment energy efficiency improvements by 2050, total CO_{2e} emissions reach 13.3 GTCO₂e. In this scenario the gap in 2050 is more than 10.4 GTCO_{2e} compared to the IEA’s 2°C scenario.



⁵ It is understood that it is not realistic to assume energy production’s carbon intensity to remain constant, however it enables this document to illustrate the scale of the challenge from a technology perspective

⁶ Note that this only relates to CO₂ emissions from the sector’s energy use, not direct emissions from refrigerants

Appendix 2: Examples of Potential Demand-Side Interventions of Cooling

1. Reducing cooling demand

Reducing demand should be a core strategy, regardless of other interventions

Social Interventions

Our use in the developed world of cooling is often profligate. Buildings are often too cold to be comfortable; we cool empty rooms and spaces; we do not put doors on supermarket chiller cabinets; we do not properly maintain the equipment so it operates efficiently. We even go so far as to create artificial micro-climates for sporting events. Expectations of space cooling in particular should be challenged both in existing and for new markets. While space cooling is likely to have significant health benefits in some temperature ranges and especially for some groups of people e.g. older people and physical workers in over-heated environments, most healthy adults have significant flexibility in the indoor temperatures they can adapt to with little detriment. This gives scope for examining norms and standards around temperatures, especially in tandem with expectations around dress and activity. For example, the Cool Biz campaign in Japan instigated by the government from 2005 onwards has saved significant amounts of energy and CO₂ by allowing more liberal dress codes in workplaces in summer (such as short sleeved shirts, no ties) so that office air conditioning could be set to 28 degrees as standard.

A project undertaken by the Rocky Mountain Institute (RMI) to design and build a zero-energy office building in Colorado, USA, shows that perceptions of comfort must be balanced with design and technology when attempting to minimize energy requirements. Smaller approaches, including fans and temperature-controlled chairs, can allow greater individual satisfaction at lower cost than single temperature controls. While compromises—including back-up systems—were ultimately included to assure occupant comfort, the project was able to demonstrate the potential benefits of moving away from a single temperature-based design criterion. RMI's experience highlights the value of considering the multiple variables that influence perceptions of thermal comfort in buildings. According to RMI "This foundation can then drive a more integrated design that uses targeted systems to enable personal comfort approaches."

Buildings

In the building sector, opportunities exist for better design and integration of low cost technologies which can have a dramatic impact on energy consumption for air-conditioning. At the very simplest level this is about natural ventilation and building design in line with more pragmatic approaches to cooling needs as well as optimised building energy efficiency. But there are also technology interventions. One family of technology is cool roofs which can be as simple as applying white paint or coatings to a roofing surface, as well as using roofing materials during construction with high solar reflectance and the ability to send radiate heat energy back into space at a specific wavelength range, cooling the immediate environment. Cool roof solutions are thought to be able to reduce air-conditioning need by 35% depending on building and climate types⁷. There are also possibilities to deploy coatings to food stuffs to reduce the need for refrigeration whilst in transit.

If the full potential of cool roofs and building design was a 35% reduction and it was universally applied to reduce space cooling needs the savings potential could be 2,865 TWh by 2050. In practice it is likely that only a fraction of this can be achieved, as the range of savings depends on building type and climatic conditions but still an important intervention.

Logistics

Alongside technology, we need a whole system approach to develop a new, more efficient paradigm of logistics and new logistics strategies that incorporate energy management as we migrate from existing energy vectors to new energy vectors. This has to consider the strategic role of energy storage as well as the specification of resource pooling protocols. Smart logistics and the combination of novel sensing technology with embedded distributed AI can deliver logistics and supply chain autonomous decision making that will yield more value than sensing and control technology will do alone.

An innovative solution to the need to transport vaccines and medicines is Zipline, launched in Rwanda in

⁷ https://www.epa.gov/sites/production/files/2017-05/documents/reducing_urban_heat_islands_ch_4.pdf

2016, which operates a drone delivery system to send urgent medicines to patients, delivering in less than 30 minutes from dedicated distribution centers and negating the need for refrigeration. Medical supplies can be ordered by text message and cost roughly the same as vehicle delivery, except that supplies are delivered in a fraction of the time.

2. Monitoring and Measurement

If you cannot measure it, you cannot improve it". Smart devices are able to control cooling flows by precise real-time monitoring and measurement, and then to intelligently control efficiency/provide time of use management when they "see" the cooling delivered is not being fully utilised. This is relevant from district cooling to supermarket chillers or air conditioning in office buildings or hospitals and even TRUs for temperature sensitive products.

This "continuous monitoring" enables data driven actions to enhance the energy efficiency of the cooling systems. It can be used to analyse system trends and help plan positive actions that benefit the system efficiency. Enhanced visibility also permits troubleshooting that pinpoints areas of interest and action. It can also support Cooling as a Service and 'Pay As You Save' Schemes to help finance energy efficient technologies

3. More Rapid Technology Take-Up

Whilst substantial improvements in appliance efficiency are proposed in the GCI mitigation scenario, there could be opportunities to accelerate deployment of best in class technologies through policy and finance interventions.

4. Skills and Maintenance

Maintenance is critical to ensure cooling appliances deliver the efficiency rating. Every 1°C rise in condensing temperature or 1°C drop in evaporating temperature increases energy consumption by 3-4%.

There are of course many other aspects of maintenance which contribute to energy efficient operation and sustained lifespan of equipment. Undercharged, / leaking refrigeration systems will cause a significant increase in energy consumption (alongside the direct impact of the refrigerant leakage) as will degraded suction line insulation or blocked condenser coils. As an example, if we have a condenser which is blocked with dirt build up and the air flow is reduced by 35%, this will result in a 15-20% rise in energy consumption.

5. Thermal Energy Storage – Renewable Integration, Grid Balancing and Load Shifting

Storing energy thermally rather than in electrical batteries allows us to make use of waste and renewable sources of heat and cold that would otherwise go unexploited, and also to convert 'wrong time' energy – such as wind or nuclear power generated at night when demand is low – into low carbon peak time thermal energy services. Thermal Energy Storage can have more than 30% lower capital cost and up to 90% lower maintenance cost than a battery electric storage system.

Thermal Energy Storage systems (i.e. ice or phase change materials) can be charged during off-peak hours with enough energy stored to meet the cooling demands during the on-peak hours of operation, thus allowing for a much smaller refrigeration or cooling system to meet the load and eliminating expensive electrical consumption during on-peak hours.

As another example supermarket refrigeration could also help raise the amount of renewable power that can be absorbed by electricity grids. That's because while wind turbines and solar panels are intermittent producers, fridges are intermittent consumers. Supermarket refrigeration systems are typically designed to match the cooling load on the hottest day in ten years, and may have spare capacity of up to 70%.⁸ that could be used to absorb excess wind or solar power and store it as cold and heat. By one estimate, if all of Germany's spare cooling compressor capacity were used in this way it could absorb 30% of Europe's wind output.⁹

⁸ www.globalopportunityexplorer.org/solutions/district-heating-with-supermarket-refrigeration-systems
⁹ http://www.huffingtonpost.com/niels-bchristiansen/supermarkets-as-the-backb_b_9607946.html

Appendix 3: Some example of barriers to deploying efficient technologies and Demand-Side Management from previous research

Issue	Description
Lack of Awareness	Cooling is a blind-spot in the key energy and climate change mitigation debates – but it has a material role in addressing socioeconomic challenges and significant impact on the energy system, climate change and pollution.
Access to Finance	Some types of cooling equipment are too expensive for the people who would benefit from them to purchase. This seems to be especially true of pre-cooling systems that could be used to reduce food spoilage in the agricultural sector, though also relevant to domestic refrigeration and space cooling.
Lack of Demand signals	Lack of future demand signals from a policy perspective is a huge barrier to investment in high performance (lower lifecycle cost) solutions.
National Interest vs. MEPS	Minimum efficiency performance standards (MEPS) and similar initiatives can be a very effective mechanism for enhancing the efficiency of equipment sold in a market place. However, attempts to protect national producers can lead to varying efficiency standards between markets. MEPS however tend to focus on performance of traditional VPC units, rather than deployment of more radical innovations and system-based solutions and strategies for cooling
Higher Purchase Prices/ total cost of ownership	<p>Frequently, more efficient technology comes with a price premium. Often customers in both domestic and commercial markets tend to be more sensitive to purchase prices as opposed to total cost of ownership.</p> <p>Few customers consider the in-life energy usage of their cooling appliances completely and because high quality consumption data is frequently lacking, comparisons between offerings are difficult for them to make.</p>
Lack of Market incentive	<p>OEMs and Tier 1s do not feel as if their customers are demanding “step-change” solutions and so are offering only incremental improvements between product releases.</p> <p>The general consensus among OEMs and Tier 1s is that traditional vapour compression cycles, paired with energy storage and niche usage of sorption technologies, will meet future cooling demands.</p>
Industry	There are limited (<5) major companies in many of the segments; the incumbents are enormous and global which means that any new innovation can only access the market through them. The vapour compression cycle technology dominates all sectors with long established manufacture, supply and servicing chains with no incentive or demand to invest in change. (internal combustion engine vs EV or bagged vacuum cleaners vs Dyson).

Appendix 4: some of the big examples how a lack of access to cooling for hundreds of millions of people means that they are unable to meet very basic needs

Comfort cooling

Heatwaves kill an estimated 12,000 people annually across the world. The WHO forecasts that by 2050, due to changing climate, deaths from heatwaves could reach 260,000 annually unless governments (primarily cities) adapt to the threat. Cooling of internal space in buildings is an essential part of this adaptation.

Productivity and thermal comfort are interrelated and by 2050 work-hour losses in some countries are projected to be as high as 12% of the total available for employment — worth billions of US dollars in productivity — in the worst-affected regions of sub-Saharan Africa and Asia. Internal space cooling is a key component in reducing these losses and facilitating economic growth through increased productivity.

Educational performance is also significantly affected by heatwaves. In this regard, research shows that during hot periods, students without air conditioning experienced significant decreases across five measures of cognitive functions, impacting on academic attainment and efforts to lift populations out of poverty through learning.

Last year, researchers projected that the share of the world's population exposed to deadly heat for at least 20 days a year will increase from 30% now to 74% by 2100 if greenhouse gas emissions are allowed to grow. (It will rise to 48% with "drastic reductions".) They concluded that "an increasing threat to human life from excess heat now seems almost inevitable".

"Dying in a heatwave is like being slowly cooked," said lead author Professor Camilo Mora. "It's pure torture. The young and elderly are at particular risk, but we found that this heat can kill soldiers, athletes, everyone."

Cold chains

A cold chain is an integrated, seamless and resilient network of refrigerated and temperature-controlled cooling facilities, cold stores, distribution hubs and vehicles used to maintain the safety and quality of goods, typically food or vaccines, while moving them swiftly from source point to consumption point. The global cold chain logistics market is worth \$200bn and is projected to grow to \$300bn by 2023.

Food

In developing countries, up to 50% of perishable food produce can be lost post-harvest primarily because of lack of adequate cooling provision in the form of a cold chain.

- More than 75% of the world's 1 billion people living in extreme poverty reside in rural areas, primarily dependent on agriculture for their livelihoods. Rural poverty cannot be addressed without cold chains connecting farmers, growers and fishermen to market opportunities.
- More than 800 million people globally are now malnourished and, for the first time in decades, the number is increasing. Malnutrition is in fact the largest single contributor to disease in the world, according to the UN's Standing Committee on Nutrition. More children die each year from malnutrition than from AIDS, malaria and tuberculosis combined. Post-harvest loss of nutritious food produce contributes to this tragic situation.

Vaccines

The World Health Organization (WHO) estimates 25% of liquid vaccines are wasted each year primarily because of broken cold chains and inadequate cooling provision. An estimated 1.5 million people die each year from vaccine preventable diseases.

Appendix 5: Artificial Cooling

Artificial cooling (refrigeration or space/personal cooling) is primarily delivered through equipment and technology in these three core application sectors:

Internal Space Cooling (comfort cooling) – the provision of cooling through air conditioning (AC) or fans for the purpose of human comfort in buildings (residential, commercial and industrial premises).

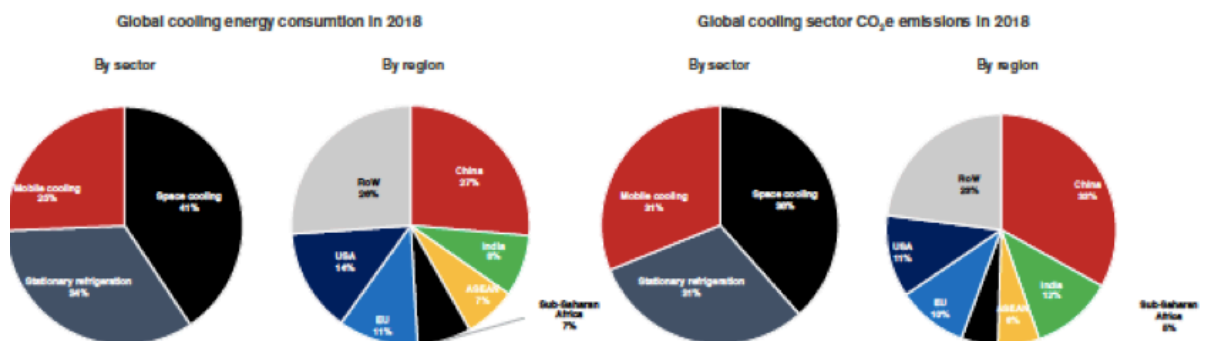
Stationary Refrigeration

- Domestic Refrigeration - the provision of cooling through static refrigeration equipment in residential buildings to safely store and extend the shelf life of food.
- Commercial Refrigeration and Industrial Cooling – the provision of commercial and industrial cooling through static refrigeration equipment in buildings (residential, commercial and industrial) to maintain and/or reduce the temperature of air, goods or equipment (e.g. food produce, industrial processes, data centres, etc.).

Mobile Cooling – the provision of cooling through vehicle AC equipment (in cars, buses & coaches, trains, etc.) and transport refrigeration equipment (for cooling of the cargo space in vans, trucks, shipping containers, etc.). Unlike the other sectors, mobile cooling consumes primarily fossil fuels since the large majority of vehicle motive power today uses hydrocarbons (petrol, diesel).

Energy consumption

- Although there are still less AC units than domestic refrigerators globally, given its energy consumption, space cooling already is the largest energy consumer amongst the cooling sectors, accounting for 41% of global cooling energy consumption. Stationary Refrigeration is the second largest consumer of energy within the cooling sectors with 34% of global cooling energy use. Mobile Cooling accounts for the remaining 25% of the cooling sectors' energy use.
- Mobile cooling however accounts for 31% of total cooling emissions despite only consuming 25% of the sector's energy. Contrary to other cooling sectors, it consumes primarily fossil fuels and is characterised by a higher share of CO₂e emissions from refrigerant leakage, equipment manufacture and disposal (37% of the sector's CO₂e emissions).
- For Space Cooling and Stationary Refrigeration, the share of CO₂e emissions from refrigerant leakage and equipment manufacture and disposal is ~27%.



Professor Toby Peters



**Engineering and Physical Sciences
Professor in Cold Economy**

Contact details

Telephone

+44 (0) 7833 601028

Email

t.peters@bham.ac.uk

Twitter

@Toby_Peters_

Professor Toby Peters is an award-winning technology developer and industrial academic with more than 14 years of experience in energy storage /energy systems (incl. policy and regulatory environments); clean cooling/the “cold economy” and the environmental, societal and economic impacts of cooling; novel technologies for refrigeration and cooling and their development and system integration. He was the joint-academic lead for the Doing Cold Smarter Policy Commission (October 2015).

Birmingham Energy Institute – Doing Cold Smarter



https://www.youtube.com/watch?time_continue=11&v=EGOjXU3BcYs



Building on work pioneering the development of the cold economy and clean cold technologies, he has now broadened this out to accelerate transformational innovation to market and improve innovation performance to help meet the world's big social and economic challenges within the limits of our natural resources and time deadlines.

Biography

Toby Peters is the inventor and architect of liquid air energy storage and the cold economy. He has created and led the development of "cleantech" around liquid air as a cost-effective energy storage and warehousing solution to a major energy challenge: environmentally and economically sustainable cooling and power in both transport and the built environment. He is internationally recognised for his role in transforming the thinking about how we deliver cooling demands sustainably and the role "clean cold" has to play in emerging market transformation.

His early career focused on strategy and disruptive innovation where he worked with a broad range of business, Government, and NGO/voluntary sector organisations to help design and deliver fundamental and far-reaching commercial and social change. His ability to create and deliver new forms of business operation and collaboration has been demonstrated in more than three decades of work.

In the early nineties as a conflict photo-journalist, he covered stories in Rwanda, Bosnia, Angola and Romania as well as the plight of street children in Peru, South America where he also co-founded a charity providing nursery education and day-care for street children.

Major technology achievements:

- Co-invented Liquid Air Energy Storage and led the development through to commercial demonstration securing more than £20M of grant, industrial and private sector funding.
- Led the development of the Dearman cold and power technology from TRL1 to commercial demonstration, securing more than £30M of grant, industrial and private sector funding.

Awards (12) include:

- The Engineer Technology and Innovation Awards, Energy & Environment; Grand Prix;
- Rushlight Award – Power Generation and Transmission; Group Energy Environmental Award;
- IET Innovation Award – Sustainability;
- Business Green Technology Award – Innovator of the Year;
- Cooling Industry Awards – System Innovation of the Year;
- Innovate UK – Inspirational Innovation;
- National Air Quality Award – Innovation in Air Quality Technology

Research

Current areas of research include:

- novel cooling technology development and demonstration;
- cooling and energy systems and modelling including impacts, barriers to exploitation, business models and unintended consequences;
- logistics/cold chain/vehicle to grid (commercial vehicles);
- accelerating technology development and improving the innovation performance;
- harnessing the waste cold of LNG into thermal energy systems for transport and built environment applications.

Other activities

- Senior Research Fellow, Transformational Innovation for Sustainability - Heriot-Watt University;
- Chair, Academic Panel - CoolingEU.
- Senior Advisor, Cooling - Sustainable Energy for All (United Nations Foundation)

Publications

- Clean cold and the Global Goals University of Birmingham, 2017
- Capturing the Waste Cold of LNG Heriot-Watt, 2017
- Measuring Technology Readiness for Investment Heriot-Watt, 2017
- India's Third Agricultural Revolution University of Birmingham, 2017
- Retail Refrigeration: Making the Transition to Clean Cold, University of Birmingham, 2017
- The Cold Economy – Why? What? How? University of Birmingham, 2016
- Cold Commission: Doing Cold Smarter University of Birmingham, 2015
- Cold Chains and the Demographic Dividend Dearman, 2015
- Liquid Air on the European Highway, The economic and environmental impact of zero-emission transport refrigeration Dearman, 2015
- Liquid Air on the Highway The environmental and business case for liquid air commercial vehicles in the UK Centre for Low Carbon Futures, University of Birmingham and Liquid Air Energy Network, 2014
- The Prospects for liquid air cold chains in India University of Birmingham, 2014
- Liquid Air in the energy and transport systems - Opportunities for industry and innovation in the UK Centre for Low Carbon Futures, to accompany Royal Academy of Engineering conference, Liquid Air in the energy and transport systems: Opportunities for industry and innovation in the UK, 2013
- Liquid Air Technologies – a guide to the potential Centre for Low Carbon Futures, University of Birmingham and Liquid Air Energy Network, 2013
- The Crisis in UK Local Food Retailing, Toby Peters, Professor Tim Lang, Thames Valley University, Centre for Food Policy, 2000

Related research

<https://www.birmingham.ac.uk/research/activity/energy/index.aspx>

Document I

STRATEGIC PLAN FOR NEXT FIVE-YEAR MANDATE PERIOD: MARCH 2020 – FEBRUARY 2025 AND TRANSITION PERIOD (NEXT 18 MONTHS)

Purpose of agenda item

The TCP needs to reach agreement on its mission, vision and direction of future work programme. This includes reaching agreement on the timeline for the transition period to relaunch in spring 2020.

Method

As a process for reaching agreement it is proposed that the draft text in bold below serves as the starting point for debate on the most important elements of the next strategic plan. On each element, delegates either agree on the draft text, or agree an action plan for resolution by the time of next ExCo meeting in April 2019. Where agreement can't be reached in the meeting, those parties unable to reach agreement will be tasked with leading the process of devising consensus wording for each section. Because later passages are dependent on earlier passages, dates for agreement of wording on each passage will need to be agreed.

Prior to the London ExCo, all delegates are to liaise with colleagues in government and more widely on the issues raised for discussion. ExCo members are also to bring edited versions of the text to the ExCo Strategy discussion as a starting point for debates on amending the wording.

The timeframes for reaching agreement are set out in the proposed timeline to the 2020 relaunch which is tabled for discussion, alteration and agreement.

The discussion will be led by the Vice-chair for strategy.

Background

Strategic discussions at the last two ExCo meetings and during the review over the summer have brought us closer to a common understanding of the strategic direction the TCP should take over the course of the first half of the next decade. The review report recommended that we should relaunch as the TCP for socio-technical research and policy advice, while also highlighting other options based around either a tighter focus on social innovation or around retaining the focus on demand side management.

It is now time for us, as the ExCo delegates representing our member countries, to make decisions on our vision for the TCP, our mission as an organisation and the focus of development for our workplan. There are two main reasons for this urgency: first, in order to develop new projects and reach out to potential new members, we need to be clear about our strategic directions; second, the IEA reporting process demands that a new strategic plan be submitted in 10 months' time.

The one-year extension to our current mandate, should it be approved by the IEA's Committee on Energy Research and Technology (CERT), will expire in February 2020. This means that the wording of the new strategic plan needs to be agreed at the April 2019 ExCo in order for it to be submitted to the IEA in summer 2019. In order for us to be ready to sign-off a final text in April 2019, we need to agree on as much as possible during the October 2018 meeting.

Strategic Plan

Each TCP's Strategic Plan is a two-page document. There is no strict template, however a good strategic plan should set out the rationale for its existence, drawing on the strategic context; a vision for the TCP; the TCP's mission; its objectives; and the set of actions designed to achieve them. The following sections of this note set out the possible elements of the next Strategic Plan.

Element 1: Strategic Context

The following short paragraph summarises the wider context within which the TCP is situated. The energy sector is evolving rapidly. Digitalisation, the electrification of transport and heat, the increasing penetration of intermittent renewable generation and the blurring of the boundaries between consumers and producers are reshaping the energy landscape. At the same time, policy makers would like to see these energy transitions accelerate in order to improve living standards and meet urgent environmental goals. Against this backdrop, policy makers need to understand the ways in which people and technologies interact in order to create the conditions for new business models to compete and flourish, social innovation to thrive and energy transitions to be successful.

Question: This is a short scene-setter – are there elements missing or other issues that delegates have with it?

Element 2: Rationale for the TCP

This paragraph situates the TCP within the IEA Energy Technology Network and lays out the scope of potential future work.

There is both a need for a better understanding of and a gap in the IEA Energy Technology Network on the nexus between people and energy technologies. The other TCPs provide a comprehensive network of technology experts; this TCP provides a home for international networks of social researchers, economists, political scientists and policy makers to work collaboratively on policy-relevant socio-technical issues.

Question: Do you agree that the rationale stems from the need for multi-disciplinary research? This is a departure from the current rationale, based around the need for demand side measures to be better represented in the energy policy mix.

Question: Is the description of disciplines sufficiently inclusive to attract the expertise needed?

Question: The scope is broad. Are you content with this? The medium-term work plan will need to narrow the scope by prioritising particular issues for research.

Element 3: Vision for the TCP

The vision for the TCP should set out the TCP's long-term goals and aspirations clearly and concisely, providing a picture of where the organisation is heading while avoiding specific measurable terms.

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

Questions: Is this suitably ambitious? Does it describe the direction you want to take the TCP? Is the terminology right? Does it exclude areas you feel should be outside the TCP's remit? Are there areas of purely social research that this vision may exclude?

Element 4: The TCP's Mission

A mission statement should be more specific than the vision, describing who the TCP serves, what it provides and how.

It is the mission of the TCP to provide policy makers with the high-quality evidence they need to create the conditions for successful energy transitions. Our international networks of socio-technical experts undertake collaborative projects overseen by an executive committee for whom policy relevance is the top priority.

Questions: Does this capture what you want the TCP to do? Are there areas in which you would like to see research undertaken for which policy relevance is a secondary priority?

Element 5: TCP Objectives for 2020-2025

The objectives of the TCP should flow from the vision and mission statement. The following objectives are set at a high level and could be made more specific if we think it appropriate.

- **To become the global hub for international collaboration on the socio-technical aspects of energy transitions**
- **To provide meaningful guidelines and recommended practices to policy makers and implementers based on international evidence**
- **To provide a global platform for networks of expertise to exchange information and analysis**
- **To act as an impartial and reliable source of information for policy makers on the socio-technical aspects of the energy sector**
- **To work with other TCPs to provide multi-disciplinary research on key energy transition topics**

Questions: Do these objectives all follow from the Vision and Mission statements above? Are any objectives missing or incomplete? More generally, do these match your views on what the objectives of the TCP should be?

Element 6: A set of actions

The Strategic Plan needs to explain what actions will be taken to achieve the objectives. This part of the document is where the meat of the strategy lies, but is the area which needs most work over the next six months.

Key areas of focus which will need to be worked up (or not) – prioritisation is needed:

- **Digitalisation and the energy – people nexus**
 - New Task on peer-to-peer trading
 - New Task on automation
- **Servitisation**
 - Task 25 on business models
 - New work on ESCOs
- **The socio-technical aspects of technological change**
 - New Task on low-carbon cooling
 - New work on low-carbon heating and transitioning away from natural gas
- **Behaviour and behaviour / systems change**
 - New work on social innovation and energy transitions
 - New work on the application of behavioural sciences for effective policy development (including from behavioural economics and social psychology)
- **Cross-cutting issues**
 - New communications strategy
 - Reaching out to other TCPs to explore the scope for joint work on some Tasks
 - Strategic approach to recruiting new members and identifying new opportunities to collaborate outside of the ideas set out above

Strategy timeline for transition to relaunch – Oct 2018 – spring 2020

An ambitious strategy requires volunteers from around the ExCo table to agree to work together on task ideas, and all people around the table to build and work their networks to give new task ideas the best chances of having wide participation. Other aspects of the TCP relaunch will also require work, including work on whether to change the name of the TCP.

A broad timeline is set out below:

October 2018-April 2019

- working up new Task ideas;
- resolving issues related to the agreement of the elements of the Strategic Plan;
- working group develops ideas for potential name change
- ESC develops draft communications strategy

ExCo April 2019

- agree draft Strategic Plan;
- agenda item on new name leads to agreement or approach to resolving issues by August 2019;
- agenda item on launch in a year's time;
- agenda items on new Task proposals
- agenda item and as much agreement as possible on new communications strategy

April 2019-October 2019

- submission of Strategic Plan, 1-year report and questionnaire (August 2019)
- resolving issues related to the agreement of the TCP's name
- resolving any issues related to the communications strategy and implementation of agreed elements (e.g. related to the website)
- development of plan for relaunch
- further Task development

ExCo October 2019

- agreement on name change (if at all)
- agreement on remaining aspects of communications strategy
- agreement on plans for launch
- agenda items on new Task proposals

October 2019-April 2020

- preparations for launch
- further Task development
- intensification of outreach to potential new members

April 2020 – relaunch

Note: The Executive Summary and Recommendations from the external review of strategy and management are reproduced here to support the session on TCP management

REVIEW OF THE INTERNATIONAL ENERGY AGENCY TECHNOLOGY COLLABORATION PROGRAMME ON DEMAND SIDE MANAGEMENT

Summary

This report was commissioned by the Executive Committee (ExCo) of the International Energy Agency (IEA) Demand Side Management (DSM) Technology Collaboration Programme (TCP). Drawing on interviews and literature, it provides an external perspective on the strategy, work programme, management and communications of the TCP. Its purpose is to inform ExCo decisions on its future direction.

The IEA, through its TCPs, creates a unique platform for global collaboration on energy technology, policy and regulation. The IEA currently engages over 6000 international experts through its TCPs that undertake world leading research, international comparative analysis and global technology benchmarking studies, and provision of evidence and advice for national governments across its member countries and beyond. As the rate of change in the energy sector increases, the importance of timely international collaboration for sharing global best practice in technology research and development; policy and regulation; and consumer acceptance and adoption, become both more important and more valuable.

A future vision for the TCP

IEA DSM has a unique opportunity to relaunch itself as the international hub for multi-disciplinary energy technology-related research and expertise. The need for work in this area is clear, as policy makers seek to better understand and accelerate the transitions taking place in energy systems around the world. And while the rest of the IEA Energy Technology Network largely focuses on the technologies underpinning the production and use of energy, what is missing is the human dimension: how are people buying and selling energy services; what is influencing technology take-up; what social innovations might be needed to meet ever more pressing climate targets; and what are the implications for policy makers? A dedicated TCP could provide that disciplinary focus and IEA DSM is uniquely well-positioned to do so, building on its existing portfolio of work.

An ambitious TCP could attract world-class research institutions to collaborate on policy-relevant topics. The IEA brand could be leveraged to draw in high-quality academics and practitioners to work on topics of interest to policy makers. Policy makers and regulators would be its core audience, but political scientists, economists, behavioural scientists and industry practitioners would benefit from participating in international collaboration in these areas alongside the more traditional engineering expertise associated with the Energy Technology Network.

A vision built around the provision of the best possible socio-technical advice to policy makers. This vision emphasises the importance of the evidence base and its analysis. It builds on one of the IEA's key strengths: its objectivity. The current vision for IEA DSM uses campaigning language: "demand side activities should be ... the first choice in all energy policy decisions". Perceptions of bias towards the demand side can weaken the organisation's message, and in terms of overlaps, there are many campaigning organisations for energy efficiency competing for space outside of the IEA family.

The TCP would need to build its own identity, with its own work programme. However, given the cross-cutting nature of the likely programme of work, it should actively seek opportunities to share knowledge with other end-use TCPs and aim to undertake joint Tasks, enabling multi-disciplinary approaches to the tackling of policy-relevant issues.

The scope of topics covered by the relaunched TCP could be broad, but each Task should be sharply focused with a clear link to policy priorities. ExCo members are interested in a wide variety of topics and should focus their efforts in building coalitions of interested parties to work together on the most important areas. While a number of high-profile projects would be expected to focus on developments in electricity markets, others would look beyond the electricity sector. Key themes include:

- **Behaviour.** A cross-cutting theme related to all the topics listed, behaviour is also an important area of interest to policy makers in its own right. To meet climate targets, technology innovations are unlikely to be sufficient meaning that social innovations will be necessary, with potential implications on lifestyles. More research in this underdeveloped area would help policy makers to understand policy options. Questions related to the potential for behavioural economics to influence policy design and the impact of information campaigns are also under-developed areas for potential research.
- **Digitalisation.** Increasing levels of automation will allow people to avoid many difficult energy-use decisions that in the past were either ignored or made without a full understanding of the costs and benefits. Research is needed to understand the new choices that consumers may be faced with and the barriers to digital technology potential related to data security and privacy. Digitalisation will also enable better monitoring and evaluation of end-use policies, enabling more outcomes-based policy development. Research into the implications of digitalisation and improvements in data analytics for demand side policies would be valuable.
- **Technology take up.** Modelling exercises that produce scenarios consistent with meeting the climate targets agreed in Paris in 2015 emphasise the need for the take-up of more efficient end-use equipment and technologies that use lower carbon fuels. Understanding the way in which diverse consumers behave when faced with choices in different contexts is essential to the development of policy frameworks in which prices, regulations and incentives are aligned to enable business models to develop and compete.
- **Impact analysis.** Demand side measures have many costs and benefits. The concept of multiple benefits is now well-understood; what remains missing are internationally agreed methodologies for undertaking analysis on the full range of costs and benefits, including in the macroeconomic sphere. A sharper focus on capturing the full range of economic impacts would help policy makers make more informed decisions.

Given the current IEA categorisation of TCPs, a relaunched IEA DSM would ideally sit within the cross-cutting theme. With a wide-ranging set of Tasks along the lines set out above, the TCP would clearly be focussing on topics that cut across a range of energy issues. However, the current vice-chair for electricity (the theme within which IEA DSM currently sits) informs me that the IEA committee structure is currently being reviewed, meaning that this issue should be reconsidered at a later date once the situation is clearer in this respect.

The current state of affairs

“The DSM TCP has been in better shape”, acknowledged the outgoing Chair in the 2017 Annual Report. Along with the retirement of the Chair in 2017, a number of potential leadership candidates, including those in Vice-Chair roles, have left the ExCo over the last two years. Nobody amongst the current ExCo has been willing to take on the role of Chair on a permanent basis.

Member countries have not been willing to fund new work for some time. The TCP has not initiated a new Task since 2014, when Task 25 (Business Models for a more effective uptake of DSM Energy Services) secured funding. The agreement to commence Phase 2 of Task 25 in May 2018 was the first time for three years that the TCP had agreed to begin any new Task work at all. A number of countries have disengaged from the TCP.

The ExCo has not been driving the work programme. All of the active Tasks are in a second or later phase, with the subsequent phases being proposed by Task operating agents. Even the most recently begun Task, Task 25, was initiated through the acceptance of a proposal by an operating agent who had been working on another Task.

The way in which Tasks are structured has contributed to the current situation. The model for IEA DSM Tasks sees an operating agent contracted to facilitate collaboration, undertake research, write reports and communicate results over a two-to-three-year period. Collaborating countries supply national experts to interact with the project and undertake relevant research related to their country. The prominent role of the operating agent in this model means that they have a strong incentive to propose extensions to existing Tasks. While there are many positive aspects to the operating agents' investment in the TCP, the ExCo has allowed its Tasks to become dominated by a small number of consultants, disengaging itself from a critical assessment of its work programme.

A number of ExCo members have expressed dissatisfaction with the management of the TCP. The distinction between ExCo members and operating agents has become blurred, with in one instance, the same person performing both duties. The rationale for decisions related to funding have not always been clear, and the secretarial and advisory roles have never been subject to competition. Between ExCo meetings, very little forward movement appears to take place on potential Task ideas, meaning that momentum is often lost and Task ideas fall away.

Recent events suggest that the TCP may have turned a corner. Australia joined IEA DSM in June 2018, bringing new ideas and a willingness to fund Tasks. A new Task was proposed by a member country delegate at the most recent ExCo meeting, and the DSM University continues to provide a useful platform for the dissemination of IEA DSM material and wider research. Without a Chair, the TCP lacks leadership, but the temporary Vice-Chairs have brought a willingness to change and have championed the commissioning of this review.

Enabling a vibrant TCP

An ambitious and highly-motivated core leadership group is essential. That team of people needs a common understanding of the value of international collaboration in this particular TCP and a shared vision for its future development. The core group needs to be ambitious and willing to work together to build the TCP into a world-class platform for international collaboration that shapes the policy debate.

Someone on the ExCo needs to step forward as Chair, at least on a temporary basis, to provide leadership at this time of transition. A new Chair is unlikely to be found from outside the organisation, given the position the TCP finds itself in. However, a successful transition would increase the likelihood of attracting someone to take the role on a permanent basis. The Chair needs to have credibility outside the TCP, as you seek to attract new members and resources. The Chair needs to be able to drive collective agreement within the TCP on a new strategy and plan of action. And the Chair needs to be able to call upon resources in their own country to back up the initiation of at least some of the new projects that will be proposed.

ExCo members must understand and act on their responsibilities. ExCo members should be motivated by the vision for the TCP, willing to participate in driving its success, active in searching out potential Task participants within their countries and eager to propose new projects. Building a network of potential participants in the TCP's work is a key responsibility. The ExCo should own and manage the work programme, with lead countries having responsibility for proposing Tasks and reporting back on them. A successfully relaunched TCP would be engaging with a broad group of stakeholders, including those in academia and industry; the ExCo would need to ensure that projects remained relevant to policy makers.

An ExCo operating agent or expert secretary would facilitate operations. All the other TCPs studied have a topic expert who provides secretariat functions. Unless provided by a member country (e.g. IEA HEV), it is paid for out of the common fund. Typically, duties involve meeting organisation, record taking and producing minutes; managing contracts with sub-contractors; producing communications materials; liaising with the IEA Secretariat; and facilitating the completion of action items between biannual ExCo meetings. Some TCPs also ask the secretary to act as the account manager too. Line-managed by the Chair, the expert secretary would not have a role in decision-making but would help a time-constrained ExCo in executing its decisions.

Collaborative projects can be structured in different ways. The Task model currently used in IEA DSM could be made to work better if the formation of Task proposals and extensions, and their subsequent management, was owned by lead member countries; national experts are part of the Task formation process; and particularly in the case of extensions, more than one operating agent was considered for the role. Other TCPs use different models that could be applied to IEA DSM. Cost-shared Annexes pool member country funds to pay for an operating agent

with a facilitation and reporting role and use the remaining funds to contract a range of contractors to provide research reports and analysis. Task-sharing is the most common model employed in TCPs; it involves national experts, usually academics, collaborating as an extension of their research, with one expert nominated as the operating agent responsible for reporting. One TCP also uses the common fund to commission ExCo projects on ad hoc issues of interest, or as a way to test the feasibility of new Annexes. Employing a range of models would enable the TCP to reach out to a broader community of potential collaborators, leading to a more vibrant organisation.

The TCP would benefit from being relaunched with a new name. The term Demand Side Management represents neither the current portfolio of projects nor the vision recommended in this report. 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” in particular 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 the demand and supply of energy. A relaunch with a new name would also mark a break with the past, signalling a new era for the TCP.

New procedures and management practices can improve the TCP’s governance. A number of changes to the way in which the TCP is run would facilitate its effectiveness. Guidance notes setting out the role and responsibilities of ExCo delegates, and the processes associated with Task initiation and management would help members to engage better with the TCP. A template for task proposals would ensure that a coherent business case is proposed, key questions are answered and ExCo members can review them easily. A template for financial reporting by Tasks would enable ExCo members to better scrutinise spending. Regular items of expenditure should be periodically reviewed for cost-effectiveness and competed for if appropriate.

The TCP should look to work with the IEA to communicate its messages. The IEA wishes to make more of the Energy Technology Network and has a much broader communications reach than any of the TCPs. Working with the IEA to craft material that they are willing to promote through their social media channels, online tools and analytical reports would enable the TCP to be much more influential than simply relying on its own communications tools. The IEA is actively considering ways in which their communications team could make more of TCP material and the potential content produced by this TCP are particularly well-aligned with the work of the IEA Secretariat. IEA DSM should keep in close contact with the IEA Secretariat and devote resources to the production of IEA-ready materials. DSM University provides a valuable channel for more pedagogic material and is seen as a good example of dissemination amongst the TCPs. A relaunch of the TCP would provide an opportunity to rebrand the webinar series, potentially losing the word “university”. The IEA DSM website is difficult to navigate, at times unintuitive, lacking an adequate search engine and in places, out of date. A relaunch of the TCP should be accompanied by a new website that better advertises the TCP’s research and provides members with the services they need. A Sharepoint site could be set up to aid co-creation amongst participants.

An action plan for the next two years

A relaunch of the TCP could take place in spring 2020. A one-year extension to the current IEA DSM mandate would mean that the TCP would have approval to operate until the end of February 2019. A new strategic plan for the period beginning in 2020 would need to be submitted to the IEA’s End-use Working Party in summer 2019 with a decision on approval made by the IEA’s Committee on Energy Research and Technology in autumn 2019. This means that the new strategic plan must be finalised at the spring 2019 ExCo. For that to happen, ExCo members will need to come to an agreement on the new strategic focus of the TCP at the autumn 2018 ExCo and engage in the drafting process between the next two ExCo meetings. A suitable global event should be sought for the launch.

A strategic plan needs to have concrete proposals that form a work programme to deliver the stated goals. By the spring 2019 meeting a number of projects would need to be sufficiently well-developed to provide comfort that the TCP can form a work programme aligned with the new strategic direction. This will require significant effort from the ExCo over the next nine months to ensure that project proposals are sufficiently well-supported by spring 2019.

New management processes will need to be developed on a timeline agreed by ExCo members. A decision on whether or not to employ an expert secretary to facilitate the operations of the TCP should be made at the autumn 2018 meeting. This role will be needed immediately to support the ExCo in its transition. (Case studies

of the roles played by expert secretaries and operating agents in a number of TCPs can be found at [Annex 5](#)). Agreement should also be sought to compete out the role at some point prior to the next five-year mandate period. Revised draft guidance documents related to the formation and management of tasks and the roles and responsibilities of ExCo members should be debated at the autumn 2018 meeting, with agreement sought in writing immediately afterwards; this will help the new work programme to develop in a coherent manner.

A pitch setting out the opportunity for collaboration is needed to attract potential new participants. At this point in the review cycle, it is too early to be definitive about the future direction of the TCP. However, the TCP needs to be able to reach out now to new, both in non-member countries and within current member countries. Given the desire to attract not only new participants, but also new members of the leadership group, the pitch will need to be both compelling in terms of the policy relevance and uniqueness of the TCP and show that there is space to lead and develop the work programme – an opportunity to form a new and dynamic part of the IEA family. See [Annex 1](#) for a draft pitch, based on the recommendations of this report. It should be amended to reflect the direction the ExCo wishes to take the TCP.

Recommendations

Strategy

Recommendation 1: IEA DSM should relaunch itself as the hub for socio-economic excellence in the Energy Technology Network, bringing multi-disciplinary expertise to policy relevant issues and providing the nexus between consumers and energy technologies.

Tasks

Recommendation 2: The work programme should be designed to access a greater diversity of high-quality expertise and research. Academic and research institutions in member countries are well-placed to provide such expertise.

Recommendation 3: The TCP should consider employing different funding models for different Tasks and adapting the current cost-shared model to ensure that participating countries maintain engagement in projects. The task-shared model should be encouraged for Tasks in which participants are primarily from academia.

Leadership

Recommendation 4: Someone on the ExCo should step forward as Acting Chair during the transition period to spring 2020. The TCP should aim to have a permanent Chair in place by early 2020.


Recommendation 5: The ESC should be expanded to ensure broader ExCo representation. Future Task/Annex leads might be invited to join the ESC as well.

Recommendation 6: Countries should consider whether there are options for alternate delegates with socio-economic expertise to help oversee the work programme and without conflicts of interest.

ExCo support measures

Recommendation 7: The TCP should consider contracting an ExCo Operating Agent as soon as possible and put in place plans to tender for Operating Agent services as soon as is practicable.

Recommendation 8: The TCP should produce new guidance for ExCo members emphasising roles and responsibilities and setting out management processes.



Recommendation 9: The TCP should put in place control mechanisms to ensure the quality of its work. Nominating delegates with primary responsibilities for reviewing each key publication could be one useful mechanism.

Communications

Recommendation 10: The TCP should consider changing its name to reflect its new remit.

Recommendation 11: The TCP should refer to its Tasks by names and not numbers.

Recommendation 12: The TCP should upgrade its website alongside a relaunch and consider setting up a SharePoint site to aid joint working.

Recommendation 13: The ExCo should manage the messaging of the TCP and work with the IEA to reach a broader audience when appropriate.

Moving towards a re-launch

Recommendation 14: An action plan is needed to plot out the relaunch of the TCP in spring 2020 alongside the start of a new five-year mandate period. Initial decisions are needed in autumn 2018 and work should begin as soon as possible to pitch the TCP's fresh focus to new participants.

Recommendation 15: The TCP should work with the IEA legal team to redraft its Implementing Agreement in time for the start of the next substantive mandate period (March 2020) or sooner if possible.

Document J

DSM TCP EXCO STEERING COMMITTEE REPORT

During the past six months fortnightly conference calls have been held.

Discussion topics have been:

Search for a new Chair

- David Shipworth has nominated himself
- Election process

Review of Strategy and Management

- Management of external reviewer
- Preparation for ExCo teleconferences
- Extension Next Term
- Negotiation of approach to one-year extension
- Preparation of letter to EUWP
- Preparation of End of Term Report and Questionnaire
- Presentation to EUWP

Strengthen TCP and TCP portfolio

- Following up on unsolicited interest (Saudi Arabia, Argentina, non-country interest)
- Reaching out to new participants in limited cases (e.g. Germany, Japan)
- Beginning process of driving new Tasks from within the TCP

Finance

- Setting up new bank account through Enova SF, Norway
- Agreeing terms of relationship with Enova SF account manager

Next ExCo in the United Kingdom

- Agreeing agenda
- Writing papers
- Securing guest speakers

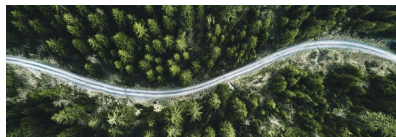
Any other business

- Presentation at IEA/G20 behaviour and energy efficiency workshop
- Discussions with IEA Legal around updating Implementing Agreement

Document K

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.

IEA SECRETARIAT NEWS



Tracking Clean Energy Progress: The IEA's new and most comprehensive analysis of the clean-energy transition finds that only 4 out of 38 energy technologies and sectors were on track to meet long-term climate, energy access and air pollution goals in 2017. The findings are part of the IEA's latest digital-only Tracking Clean Energy Progress (TCEP), a newly updated website

that assesses the latest progress made by key energy technologies, and how quickly each technology is moving towards the goals of the IEA's [Sustainable Development Scenario \(SDS\)](#). The TCEP [web portal](#) provides easy navigation across technologies and sectors, and draws links across the IEA's resources. The information will be updated throughout the year as new data becomes available, and will be complemented by cutting-edge analysis and commentary on notable developments on the global clean energy transition. Find out more at www.iea.org/tcep.

World energy leaders participate in CEM9 and MI3

The IEA Executive Director led the IEA delegation to the ninth Clean Energy Ministerial (CEM9) and the third Mission Innovation Ministerial (MI3), hosted on 22 - 24 May 2018 by the European Commission, Denmark, Finland, Norway, and Sweden, and held under the overarching theme of energy integration and the transition towards a competitive and innovative low carbon economy. Dr. Birol launched the new TCEP web portal and delivered keynote speeches at each CEM9 and MI3. The IEA signed a Letter of Intent on IEA-MI cooperation that sets the framework for enhanced collaboration on energy RD&D data, tracking innovation progress, multi-lateral cooperation through TCPs, as well as stronger engagement for in-country innovation analysis. The IEA also organized many CEM9 side events and roundtables on cooling, systems integration, EVs, finance, CCS, and women in clean energy. Further information available at <https://www.cem9-mi3.eu/>

IEA hosts workshop to support worldwide uptake of carbon capture technologies

The IEA hosted a [workshop](#) on 13-14 June to discuss how innovative policy approaches and new business models can accelerate investment in carbon capture, utilisation and storage (CCUS). CCUS provides a key solution to reconcile the global reality of a large and relatively young fleet of coal-fired power stations with the need for deep emissions reductions. The workshop builds on the themes and priorities discussed at the high-level [CCUS Summit](#) hosted by the IEA in November 2017 and that will be further discussed and at the CCUS summit planned in the last quarter 2018. In May, the IEA also participated in the launch of a new [CCUS initiative](#) as part of the 9th Clean Energy Ministerial.

IEA holds high-level meeting on the future of nuclear power

On 29 June the IEA hosted a high-level event titled "Nuclear Energy: Today and Tomorrow". The event brought together ministers and senior government officials from IEA member countries, CEOs and experts, to examine the role of nuclear energy in mature power markets and the challenges and future for nuclear energy for energy security, the economy and the environment. See the [news item](#) on the IEA website. For more on the recent trends and prospects of nuclear power, visit the IEA's new Tracking Clean Energy Progress [page on nuclear](#).

World Energy Investment Webinar: 17 July 14:00 CEST

Tune in for the launch webinar of the 2018 edition of [World Energy Investment](#). Learn more about the key trends in energy sector investment and financing, and how investment decisions taken today are determining how energy supply and demand will unfold tomorrow. Register [here](#).

TCP forum: www.iea.org/tcp/forum username Forum password network

Committee on Energy Research and Technology (CERT)

Updates from the 4-5 June 2018 meeting; the next CERT meeting will take place on 30-31 October 2018.

New CERT Vice-Chair: The CERT has elected Nelson Mojarro from Mexico as a Vice-Chair to the group. This is the first time a representative of Mexico is elected to a leadership position of any IEA Standing Groups or Committees. The election of the new CERT Vice-Chair will be presented to the Governing Board for approval at its next meeting.

New CERT Task Forces

At its meeting in February 2018, the CERT decided to create three Task Forces to help implement its strategic priorities in 2018 and beyond. Co-led by CERT delegates, and assisted by the IEA Secretariat, the three focus areas are:

Task Force #1 on PARTNERSHIPS: examining linkages and synergies with other initiatives and partnerships, including the Clean Energy Ministerial and Mission Innovation;

Task Force #2 on OPERATIONS: advising on priority topics for CERT meetings, and considering ways to make CERT processes and operations more dynamic; and

Task Force #3 on TCPs' ENHANCEMENT: overseeing the implementation of the Action Plan for TCPs' Enhancement.

Action Plan for TCPs' Enhancement

At its June meeting the CERT approved the Action Plan for TCPs' Enhancement. There are four action areas:

1. Enhanced TCP-IEA collaboration
2. Engagement with governments and private sector
3. Interactions with multilateral initiatives
4. Awareness, communication and visibility

The final version of the document is available for download on the

Forum: <https://www.iea.org/media/protected/iaforum/TCPActionPlanFINAL4June2018.pdf> (login details are in the footer at the bottom of this page).

The Secretariat stands ready to support discussions on the implementation of the TCP Action Plan at the upcoming meeting of each of the CERT Working Parties. Under the leadership of the CERT Task Force #3, the Secretariat in collaboration with CERT and Working Party delegates will periodically inform TCPs on progress with the implementation of the Plan.

CERT thematic session on nuclear power (5 June 2018)

As part of the June CERT meeting, the Secretariat organised a thematic session on nuclear fission and fusion power, to discuss issues relevant to nuclear energy technology, research and innovation, and the relevant policy landscape. The Secretariat provided an oral report on recent IEA analysis on nuclear power, followed by an updated from the Nuclear Energy Agency, and the Annual Report presented by the Chair of the Fusion Power Co-ordinating Committee. A highlight of the session was the oral reports provided by several CERT delegations on national priorities, opportunities, and challenges in the areas of nuclear energy technology and collaboration.

CERT-SLT workshop (5 June 2018)

Since 2013, the Standing Group on Long-Term Co-operation (SLT) and the CERT have held regular joint workshops to discuss issues of common interest relevant to the energy technology and policy landscape. These joint events aim to enhance strategic collaboration in the spirit of long-term commitment and to derive meaningful information for country decision makers. The focus of this year's joint CERT-SLT workshop was on digitalisation and energy. The event built on the experiences of Denmark, Estonia, Switzerland and Italy, and the growing [IEA body of work](#) in this area. A number of CERT and SLT delegates participated in the engaging discussions under three thematic sessions.

Working Parties and Experts' Groups

Fusion Power Co-ordinating Committee (FPCC)

On 19 June the FPCC held a mid-year webinar with representatives of the fusion-related TCPs. The aims were to track progress with the 2018-2020 strategic objectives, to highlight opportunities under the TCP

Action Plan relating to communication, and to gather further views from TCPs. Six TCPs submitted 2-page mid-year reports that served as background for the two-hour meeting.

Working Party on Energy End-Use Technologies (EUWP)

The **74th meeting of the EUWP will take place 12-14 September** in Paris. Key items on the agenda include evaluation of the past term and preparations for the request of extension of the EUWP's term. The EUWP meeting will be held back-to-back with the meeting of the Energy Efficiency Working Party (EEWP) and the two groups' leaderships are planning to discuss opportunities to strengthen synergies, improve efficiencies and rationalise resources. On 12 September 2018 the two Working Parties in collaboration with IPEEC could co-host a workshop in support of G20 activities on Behaviour Change for Energy Efficiency: Opportunities for International Cooperation. On 13 September the EUWP is planning to review and discuss five TCP requests for extension: buildings (4E TCP, EBC TCP), electricity (DSM TCP), and transport (AFC TCP, Combustion TCP).

Transport Co-ordination Group (TCG): The next TCG meeting will be held 11 September 2018 in Paris at the IEA premises.

Working Party on Renewable Energy Technologies (REWP)

The 74th meeting of the REWP will take place in Rome on 25-26 October 2018 in Rome. Information on the draft agenda will be available in Q3 2018.

Working Party on Fossil Fuels (WPF)

The 74th meeting of the WPF took place in Banff, Canada on 5-7 June. The meeting was held in conjunction with the Gas and Oil Technology Collaboration Programme (GOTCP) Executive Committee meeting and featured a comprehensive agenda led by the Canadian hosts (Natural Resources Canada). Session themes included carbon capture and utilisation, integrating renewables in the oil and gas sector and regulatory approaches to addressing methane emissions. In a closed-door session, the Working Party considered the request for extension for the Clean Coal Centre TCP and GOT TCP, and also confirmed the re-election of Mr Jarad Daniels as WPF Chair for a second term. A very big thank you to NRCan for the outstanding meeting arrangements! The next WPF meeting will take place in December 2018 in Paris.

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

On 28-29 May the EGRD held a meeting in Brussels on addressing the Energy-Water Nexus through R&D planning and policies. The next workshop of the EGRD will take place on 22-23 October in Germany. The proposed topics are "system resiliency and flexibility" and/or "new energy market design". The Secretariat would welcome any inputs and suggestions in preparation for the event - please contact carrie.pottinger@iea.org.

Technology Collaboration Programmes (TCPs)

TCP Survey

In early 2017, 90% of TCPs responded to an IEA Secretariat survey designed to identify opportunities for future co-operation and ways to better support TCPs. The information received informed preparations for the TCP Universal Meeting in October 2017 and led to the development of a series of actionable next steps formulated under the *Action Plan for TCPs' Enhancement*.

In the third quarter 2018, the Secretariat is preparing a new TCP-wide survey intended to gauge TCPs' emerging priorities and challenges across a number of different areas as well as to capture information relating to TCP operations and to gather views on the upcoming revamping of the IEA website section dedicated to TCPs. The survey would also inform discussions in preparation for the third TCP Universal Meeting in 2019.

Modernisation of the TCP legal mechanisms

The IEA Secretariat is beginning to explore potential updates to the TCPs' legal mechanisms in order to simplify procedural requirements and enable new types of collaboration beyond what is currently possible under the legal framework. Initially, the IEA Legal Office will adopt a "pilot" approach, which will involve identifying innovative proposals from individual TCPs, providing targeted assistance to overcome any legal

challenges, and then sharing successful ideas with similarly situated TCPs. For more information about this effort, please contact K.C. Michaels (K.C.MICHAELS@iea.org).

New participations in TCPs (since 1 April 2018)

DHC TCP: **China** District Heating Association (Contracting Party)

IETS TCP: The **French** Environment and Energy Management Agency (Contracting Party)

IETS TCP: Natural Resources **Canada** (Contracting Party)

C3E TCP: Department of the Environment and Energy of **Australia** (Contracting Party)

AMF TCP: Ministry of Petroleum and Natural Gas of **India** (Contracting Party)

4E TCP: **China** National Institute of Standardization (Contracting Party)

ST TCP: Ministry of Science and ICT of **Korea** (Contracting Party)

Participation of China in TCPs

The Ministry of Science and Technology of China (MOST) must approve the participation of all Chinese entities in TCPs, following a procedure that is unique to China and that may be different from the process for other countries' participation. Before sending letters of invitation to Chinese entities TCPs are invited to contact the Secretariat (claire.hilton@iea.org) for further information.

New or revamped TCP websites:

CTP TCP (<http://ctp.jet.efda.org/tcp/>)

ST TCP (<https://iea-st.pppl.gov/>)

GHG TCP (<https://ieaghg.org/>)

IETS TCP (<https://iea-industry.org/>)

IEA legal advice on TCP-related matters

If you have any questions about TCP procedural or governance matters, including membership and reporting requirements, please contact claire.hilton@iea.org.

Mapping of TCP activities

The Austrian Energy Agency recently completed a mapping exercise of TCPs which is now available [here](#). The aim of the project was to identify opportunities, gaps and linkages among TCP collaborative efforts, thus providing guidance for further co-ordination between TCPs and Working Parties. The report describes the methodology, selected results and some findings in more detail, and enables interested parties to make use of the graph-based database which is provided as open source. Data was collected and assessed in September 2017. The IEA Secretariat wishes to thank the Austrian Energy Agency and all those involved in the collection of data and preparation of this valuable resource.

<https://nachhaltigwirtschaften.at/en/iea/technologyprogrammes/mapping-of-iea-tcps.php>

Are you a Mission Innovation Champion?

Mission Innovation Champions is a new recognition programme to celebrate and support innovative individuals who are accelerating the clean energy revolution. This programme will recognise exceptional researchers and innovators who are developing novel ways of making energy cleaner, cheaper, and more reliable and using it more efficiently. The programme will call worldwide attention to the most promising ideas from across the globe, and seek to facilitate engagement among the awardees and Mission Innovation governments, research institutes, affiliated organisations, and private sector investors. Registration closes 10 September 2018. To learn more and to register, visit www.michampions.net.

The Solar Impulse Foundation is seeking independent experts

The Solar Impulse Efficient Solution Label rewards the economic and technological effectiveness of solutions that protect the environment. The label can be applied to products, processes and services and serves as an indication

of quality to those looking to implement clean solutions, and affords a competitive edge to the innovators behind them. Each solution goes through a strict assessment process performed by independent experts. TCP representatives and participants in TCP activities interested in collaborating with the Solar Impulse Foundation as independent experts are invited to contact Diana.Louis@iea.org and Cecilia.Tam@iea.org for further information

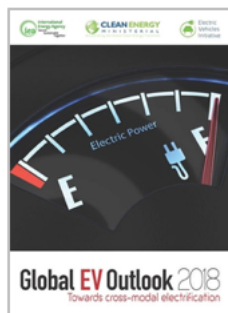
IEA Secretariat – points of contact for the Energy Technology Network (changes since 1 April 2018 are marked in italics)

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

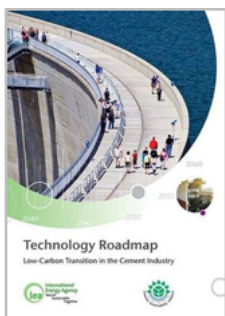
IEA Publications (available for free download):



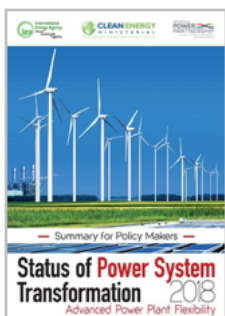
The Future of Cooling: Rising demand for space cooling is putting enormous strain on electricity systems in many countries, as well as driving up emissions. Absent firm policy interventions, global demand for space cooling and the energy needed to provide it will continue to grow for decades to come. This IEA report aims to raise awareness about one of the most critical energy issues of our time, outlining a sustainable path to the future of cooling that will allow people to reap the benefits without straining the energy system or the environment. www.iea.org/cooling/.



Global EV Outlook: The Global EV Outlook is an annual publication that identifies and discusses recent developments in electric mobility across the globe. Combining historical analysis with projects to 2030, the report examines key areas of interest such as electric vehicle and charging infrastructure deployment, ownership costs, energy use, CO₂ emissions and battery materials demand. The publication includes policy recommendations, learning from frontrunner markets to inform policymakers and stakeholders who aim to encourage electric vehicle adoption. <http://www.iea.org/gevo2018/>



Technology Roadmap: Low-Carbon Transition in the Cement Industry: This publication sets a strategy for the cement sector to achieve the decoupling of cement production growth from related direct CO₂ emissions. The report outlines a detailed action plan for stakeholders to 2050 as a reference and source of inspiration for international and national policy makers to support evidence-based decisions and regulations. <https://webstore.iea.org/technology-roadmap-low-carbon-transition-in-the-cement-industry>

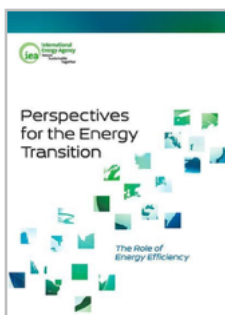


Status of Power System Transformation: This report provides a comprehensive overview of how power plants can contribute to making power systems more flexible, while enhancing electricity security. It summarises the findings of the Advanced Power Plant Flexibility campaign of the Clean Energy Ministerial, and solutions presented have been collected in close collaboration with industry stakeholders. <https://webstore.iea.org/status-of-power-system-transformation-2018-summary-for-policy-makers>



Offshore Energy Outlook: This new report, in the World Energy Outlook series, addresses all aspects of offshore energy production, how they are today and how they might evolve in various scenarios in the future.

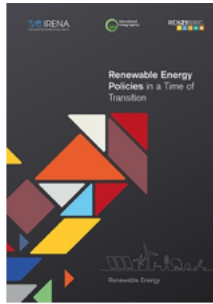
<https://www.iea.org/weo/offshore/>



Perspectives for the Energy Transition: In support of its presidency of the G20 in 2017, the German government requested the IEA and IRENA to explore how an energy transition to address climate change might look. In this follow-up study, the IEA takes stock of progress towards a low-carbon energy sector and provides further insights into the fundamentally important role of energy efficiency to achieve a clean energy transition.

<https://webstore.iea.org/perspectives-for-the-energy-transition-investment-needs-for-a-low-carbon-energy-system>

TCP forum: www.iea.org/tcp/forum username Forum password network



Renewable Energy Policies in a Time of Transition: This report, prepared jointly by IRENA, the IEA, and REN21, identifies key barriers and highlights policy options to boost renewable energy deployment. <https://webstore.iea.org/renewable-energy-policies-in-a-time-of-transition>

IEA DSM PROGRAMME VISIBILITY COMMITTEE REPORT

Submitted by Josephine Maguire

Introduction

In this report we provide information and statistics on our various routes and tools to communication of our work, including our website, newsletter and brochures/flyers, our key publications and our presence on social media channels.

While at our last ExCo meeting we discussed some changes, innovations and refinements that need to be made to our approach to Communications, it is seen as better to wait for the outcome of our deliberations on strategy, structure and our request for a 1 year extension, before we undertake any further analysis and recommendations for this area.

Annual Report

The 2017 Annual Report, including a Theme Chapter on **“What is the benefit of collaboration for your country in the DSM TCP?”** was made available electronically to Executive Committee members, Operating Agents and the EUWP and EEWP by the end of January 2018 and was uploaded to the IEA DSM website. It was decided at the ExCo meeting in Stockholm, March 2016 that printed copies will not be available any longer, however the IEA would like to be able to print on demand and Anne Bengtson has confirmed that a printable pdf version from the desktop publisher will be provided every year. Executive Committee Members and Operating Agents were told to ensure that links to the report are distributed widely to all interested parties.

Issues for Executive Committee member decision

Decide on a Theme for the Theme Chapter in the 2018 Annual Report

As this report is seen as part of our calling card to attract new members, we are suggesting that this year we consider a shorter, more succinct and targeted report. The proposal is to ask each member to submit a one-page outline of their priority areas and how this fits with our new strategic direction as a TCP- the behavioural aspects of the technology/people nexus. We can then edit these submissions down to a cohesive story for the TCP and include it in the annual report.

Website

The new website has been updated and has been operational since July 2015. It has undergone annual maintenance and upgrades since then. All ExCo delegates and Operating Agents are strongly encouraged to review the whole website regularly, particularly areas relevant to their activities. It is very easy for information to become out-dated and it is particularly important to upload any new reports and publications as soon as they come out (also include them as headline news items by ticking the appropriate box). Operating Agents are expected to keep their own Task areas up to date, but other feedback, reporting of functions that appear not to work and suggestions for further improvements should be made via Anne Bengtson anne.bengtson@telia.com and/or the Visibility Committee. In particular, we would be interested to know how useful the social network links are.

Statistics

Website traffic from March 1 2018 to August 31 2018:

4,677 Sessions with 3,223 unique users

Averaging 25.5 hits per day

Average time spent on site: 02:27

67% new visitors

Table of Traffic and User Engagement by Country:

	Country	Sessions	New Sessions	New Users	Bounce Rate	Pages/Session	Average Duration	Report Downloads
1	United States	884(18.90%)	78.39%	693(22.01%)	77.94%	1.77	0:01:16	21(5.97%)
2	France	492(10.52%)	75.00%	369(11.72%)	67.68%	1.73	0:01:34	29(8.24%)
3	Sweden	247(5.28%)	23.89%	59(1.87%)	31.58%	4.09	0:06:45	55(15.62%)
4	United Kingdom	215(4.60%)	76.28%	164(5.21%)	64.19%	2.1	0:01:53	8(2.27%)
5	Norway	188(4.02%)	45.74%	86(2.73%)	56.38%	2.47	0:02:37	23(6.53%)
6	India	186(3.98%)	86.56%	161(5.11%)	73.66%	1.87	0:01:48	12(3.41%)
7	South Korea	136(2.91%)	69.85%	95(3.02%)	66.91%	3.85	0:05:39	35(9.94%)
8	Germany	135(2.89%)	72.59%	98(3.11%)	63.70%	2.49	0:02:36	2(0.60%)
9	New Zealand	131(2.80%)	34.35%	45(1.43%)	45.80%	3.09	0:05:58	52(14.77%)
10	Netherlands	125(2.67%)	51.20%	64(2.03%)	40.00%	3.16	0:03:28	9(2.56%)
11	Philippines	119(2.54%)	97.48%	116(3.68%)	89.08%	1.18	0:00:34	0(0.00%)
12	Australia	115(2.46%)	69.57%	80(2.54%)	52.17%	2.77	0:04:04	11(3.12%)
13	Italy	115(2.46%)	74.78%	86(2.73%)	54.78%	3.06	0:02:52	10(2.84%)
14	China	109(2.33%)	69.72%	76(2.41%)	95.41%	1.09	0:00:23	0(0.00%)
15	Belgium	108(2.31%)	56.48%	61(1.94%)	60.19%	2.23	0:01:51	9(2.56%)
16	Austria	99(2.12%)	51.52%	51(1.62%)	44.44%	3.48	0:03:45	17(4.83%)
17	Canada	95(2.03%)	65.26%	62(1.97%)	48.42%	3.37	0:03:24	8(2.27%)
18	Poland	86(1.84%)	11.63%	10(0.32%)	81.40%	1.62	0:01:52	4(1.14%)
19	Ireland	73(1.56%)	61.64%	45(1.43%)	57.53%	2.19	0:01:51	6(1.70%)
20	Switzerland	67(1.43%)	65.67%	44(1.40%)	50.75%	2.64	0:03:14	3(0.85%)
	Totals	4,677	Average 67.22%	3,148	Average 64.81%	Average 2.29	Average 00:02:27	352

Visitors from South Korea continue to spend the most time on the site, and while they only account for 2% of traffic, make up 9% of report/publication downloads.

As a percentage of traffic, Sweden, New Zealand, South Korea, Norway and the United States show the most interest in downloading reports.

Users from France show increased interest, more than doubling the number of unique visitors since the last reporting period.

Report and other Publication downloads are down slightly, with 352 downloads since March 1 (down from 403).

The top topics for report downloads were:

Topic	Downloads
Task 24	73
Task 25	61
Legal Text	55
Task 17	37
Participation	30
Task 16	24
Task 13	22
EGRD	14
Article - Agricultural pump set efficiency improvement program	5
Dublin Ireland Workshop	5

Maintenance

The annual Hosting & Maintenance Contract is up for renewal. Additionally, Karl reports that he is working with Shawn from Circle 8 on a proposal to perform a performance overhaul, to increase the speed and ease-of-use of the back end and give the front-end a refresh as it has been over 3 years since the website was launched and the technology is showing it's age.

Issues

The Executive Committee will discuss at the meeting in London the proposal that Karl is putting together with Shawn. No additional work on the website should be done before the members reach a decision on further work.

Executive Committee members should review the website regularly to ensure it reflects their work and priorities. If anything is missing it should be drawn to the attention of the visibility committee/vice chairs.

Operating Agents should update their own work/interests, especially reports, any filmed workshops for YouTube, presentations for slideshare etc. The website is only as good as if there is frequently updated content available. Most updates are from Task 24 and the IEA DSM Secretary.

Spotlight Newsletter

In the past 6 months, two DSM Spotlight newsletters have been published:

Articles in Issue 68/March 2018:

- The Role of Climate Finance to Enhance Demand-Side Management in Developing Countries
- Task 25: New Business Models Needed for New Energy Services
- Peer-to-Peer Energy Trading Using Blockchains
- DSM University
- Norway: Smart power management can save Norway billions
- New DSM Publications

Articles in Issue 69/June 2018:

- Task 16: A New Take On Crowdfunding – CF4EE
- Task 24: Energy Saving Kit Programmes in Ireland and New Zealand
- Task 25: New Business Models Needed for New Energy Services

- DSM University

The next dates for submission to the Spotlight Newsletter issues are:

September 2018

December 2018 - articles due Oct 12 (out of office most of Nov so earlier date)

March 2019 - articles due Feb 1

June 2019 - articles due May 1

September 2019 - articles due Aug 1

December 2019 – articles due Nov 1

The Spotlight Editor Pam is looking for articles on DSM work in different countries and other work Operating Agents and Executive Committee members are involved in. The Programme has tremendous news to share so please continue to think about, suggest and submit future articles. The Editor is happy to work with you on an article in any form – completed article by you or someone else, information for an article that you would like for the Editor to write, a conference paper that the Editor can convert into a newsletter article or just an idea that you think would make an interesting article. If you have an article to contribute, please email it to Pam Murphy [pmurphy@kmggrp.net]. We are also looking for a country highlight for the December issue. (article due 12 October)

Issues

Four newsletters will be published in 2018 and depending on Executive Committee members decision in London 4 newsletters are scheduled for 2019 – see above schedule, if the members decide they would like to continue having a spotlight newsletter, or if they have other ideas on options for communicating our stories and news.

Brochure

The brochure and inserts have been updated with the new logo and branding in 2015.

Task Flyers

Task flyers are up to date.

Key Publications

During the past six months a few publications have been added to the website:

[Norway country report Task 25](#) (16 April 2018)

[Overview of all energy service businessmodel cases Task 25](#) (16 April 2018)

[The 4 business model strategies for energy services task 25](#) (16 April 2018)

[Task 24 ST6&7 Ireland: Cross-Country Case Study Comparison – Energy Saving Kit Programmes](#) (14 June 2018)

[Task 24 Subtask 6&7 – Case Study Analysis: Home Energy Audit Tool \(HEAT\) kits in New Zealand](#) (14 June 2018)

[Task 24 Subtask 8 – The A to Z of Storytelling in Task 24](#) (1 August 2018)

See latest key publications: <http://www.ieadsm.org/publications/key-publications/>

Executive Committee members and Operating Agents are reminded that it is up to them to nominate publications to become “key” to Josephine Maguire while waiting for the third Vice Chair to be appointed.

Social Media

The Implementing Agreement is getting more traction on social media. We now have a presence on:

- Facebook (IEA DSM Group) with 210 members and growing. Even though most posts are by Anne Bengtson, Rob Kool and Hans Nilsson, there are regularly posts and questions by other participants;

- LinkedIn (IEA DSM Group) closed as it was not utilised.
- Twitter (@IEADSM) with 577 followers and 1658 tweets. This is the fastest growing social media platform and has fostered a lot of great engagement, re-tweets and mentions. Especially the Academic and Industry sectors seem to respond to this medium. Dr Sea Rotmann is posting for this group.
- IEA DSM Youtube Channel with 68 videos – 27 are Task 24 videos and 41 are DSM University webinars. We need more content from other Tasks. If we start filming some Executive Committee workshops, this would be a great channel to distribute visual information fast.
- Slideshare IEA DSM Programme Bengtson: static at 142 slideshares. Unless Operating Agents send their slides to the Secretary to upload with specific instructions to do so, the slides will become outdated.
- Templates have been developed for reports and power points, please use them and make sure to use the ones with correct fonts (NOT HelveticaNeuSt).

Communications Plan and Dissemination Strategies

A new Communications plan for the DSM Technology Collaboration Programme (DSM TCP) will be drafted in line with the Strategy.

Josephine Maguire

MISCELLANEOUS

Action items resulting from the Fifty First Executive Committee meeting

17-18 April, Bergen, Norway

WHO	ACTION	WHEN
India Spain	Pay Common Fund invoice for 2015	ASAP
India Spain	Pay Common Fund invoice for 2016	ASAP
Belgium India Spain	Pay Common Fund for 2017	ASAP
Anne Bengtson	Keep reminding those who have outstanding payments to the Common Fund	On-going
David Shipworth Even Bjørnstad	Write letter to the EUWP requesting a one year extension	DONE
David Shipworth Even Bjørnstad	Maintain contacts with China (NDRC), Thailand (EGAT), IBM (Germany), Australia, Portugal and Chile.	On-going
Hans Nilsson Hans de Keulenaer	Move forward with the DSM University according to plan – as well as continue to plan/hold webinars the first weeks of every month	On-going
Operating Agents	Update a more clear definition in Legal Annex text of their Task	Ongoing
Matthias Stifter Markus Bareit	Further proposal for a Task on Big Data and present at the next ExCo meeting	On-going
Anne Bengtson Peter Warren	Prepare administrative details for the Fifty second Executive Committee Meeting in Bergen, Norway	DONE
Anne Bengtson	Send out invitations first week of August	DONE
ExCo members	Review website regularly and suggest further developments	On-going
ExCo members	Suggest topics for the Spotlight Newsletter and provide input for those articles to Pam Murphy	On-going
All	Suggest recommendations to update the website	On-going
Operating Agents	Prepare Task Information Plans and include in each Task Status Report.	On-going
Pam Murphy	Distribute issues of the DSM Spotlight Newsletter	June 2018 September 2018
Operating Agents	Include 1-2 slides in Task presentation, highlighting the main findings to date in respective Task(s).	Present at next ExCo meeting
ExCo members	Provide ideas to Jan Bleyl, Task 16 for further work	On-going
All	Provide input to the 2018 Annual Report	15 November 2018
ExCo members	Those who are interested in participating in Task 17 should contact Anna Kosek for a meeting to set up the Task Definition stage – alt conf. call	On-going

Hans Nilsson	Task Zero: Prepare Task Status Report and send to Anne Bengtson for inclusion in the Pre-Meeting Document.	Friday 3 Sept 2018
Hans Nilsson Hans de Keulenaer	Prepare Status Report on the development of the DSM University and send to Anne Bengtson for inclusion in the Pre-Meeting Document (PMD).	Friday 3 Sept 2018

Jan Bleyl-Androschin	Prepare a Final Management report for Task 16 Phase 4 and send to Anne Bengtson for inclusion in the Pre-Meeting Document (PMD).	Friday 3 Sept 2018
Anna Kosek	Prepare Status Report for Task 17 Phase 4 and send to Anne Bengtson for inclusion in the Pre-Meeting Document (PMD).	Friday 3 Sept 2018
Even Bjørnstad David Shipworth	Prepare ESC progress report and send to Anne Bengtson for inclusion in the Pre-meeting Document (PMD).	Friday 3 Sept 2018
Markus Bareit Matthias Stifter	Prepare concept paper on Big Data for Energy Efficiency and send to Anne Bengtson for inclusion in the Pre-meeting Document	Friday 3 Sept 2018
Sea Rotmann	Prepare Task Status Report Task 24 Phase II and send to Anne Bengtson for inclusion in the Pre-Meeting Document (PMD).	Friday 3 Sept 2018
Ruth Mourik	Prepare Task Status Report for Task 25 and send to Anne Bengtson for inclusion in the Pre-Meeting Document (PMD).	Friday 3 Sept 2018
Even Bjørnstad Anne Bengtson	Prepare Financial Report and send to Anne Bengtson for inclusion in the Pre-Meeting Document	Friday 3 Sept 2018
David Shipworth Even Bjørnstad Josephine Maguire	Prepare Visibility Report for inclusion in the Pre-Meeting Document.	Friday 3 Sept 2018
Weber Web	Provide statistics for every Task every six months and send to David Shipworth/Even Bjørnstad/Anne Bengtson for inclusion in the Pre Meeting Document.	Friday 3 Sept 2018
Anne Bengtson	E-mail pdf file of Pre-meeting Document for the Fifty Second ExCo meeting to the Executive Committee members and Operating Agents.	Tuesday 11 Sept 2018

Participation

Executive Committee Members DSM Technology Collaboration Programme

*Participants at the Executive Committee meeting 17-18 April, 2018, Bergen, Norway

Chairman

Position to be filled

Vice Chairman

Mr. Even Bjørnstad*
Enova SF
Postboks 5700 Torgarden
N-7437 Trondheim
Telephone: (47) 73 19 04 30
Mobile: (47) 99 638218
E-mail: even.bjornstad@enova.no

Vice Chairman

Mr. David Shipworth*
UCL Energy Institute
Central House, 14 Upper Woburn Place
WC1H 0NN London
United Kingdom
Telephone: (44) 118 378 7177
Telefax: (44) 118 931 3856
E-mail: d.shipworth@ucl.ac.uk

AUSTRALIA

Tony Fullelove*
Monash University
30 Research Way
Clayton, Victoria 3800
E-mail: Tony.Fullelove@monash.edu

AUSTRIA

Contacts for Austria

Ms. Sabine Mitter
E-mail: sabine-mitter@bmvit.gv.at

Mr. Michael Huebner
E-mail: Michael.huebner@bmvit.gv.at

Maria Bürgermeister-Mähr
maria.buergermeister-maehr@ffg.at

BELGIUM

Mr. Francois Brasseur*
Attaché
Direction Générale Energie –
Relations Extérieures
SPF Economie
Boulevard du Roi Albert II, 16, 1000 Bruxelles
Telephone: (32) (0) 22 779 852
Telefax: (32) (0) 22 775 202
E-mail: francois.brasseur@economie.fgov.be

FINLAND

Mr. Jussi Mäkelä
TEKES
P.O. Box 69
FI-00100 Helsinki
E-mail: jussi.makela@tekes.fi

INDIA

Mr. Abhay Bakre
Director General
Bureau of Energy Efficiency
Government of India, Ministry of Power
4th Floor, Sewa Bhawan
R.K. Puram, Sector 4, New Delhi – 110066
Telephone: (91) 11 2617 8316
Telefax: (91) 11 2617 8328
E-mail: dg-bee@nic.in

Mr. Arijit Sengupta (contact person)
Bureau of Energy Efficiency
Government of India, Ministry of Power
4th Floor, Sewa Bhawan
R.K. Puram, Sector 4, New Delhi – 110066
Telephone:
E-mail: asengupta@beenet.in

Copy of e-mails to: Meera Shekar
E-mail: shekar.meera@gov.in

Ireland

Ms. Josephine Maguire*
National Coordinator Better Energy
Sustainable Energy Ireland
Wilton Park House
Wilton Terrace
Dublin 2
Telephone: (353) (0) 1808 2088
E-mail: Josephine.maguire@seai.ie

Mr. Jim Scheer
National Coordinator Better Energy
Sustainable Energy Ireland
Wilton Park House
Wilton Terrace
Dublin 2
Telephone: (353) (0) 1808 2093
E-mail: jim.scheer@seai.ie

ITALY

Mr. Simone Maggiore*
Ricerca sul Sistema Energetico – RSE S.p.A
..Energy Systems Development Department
Via Rubattino 54
20134 Milano
Telephone: (39) 02 3992 5238
Telefax: (39) 02 3992 5597
E-mail: simone.maggiore@rse-web.it

Mr. Marco Borgarello
Ricerca sul Sistema Energetico - RSE S.p.A
Power System Development Department
Via Rubattino, 54, 20134 Milano
Telephone:
Telefax:
E-mail: Marco.Borgarello@rse-web.it

REPUBLIC OF KOREA

Mr. Sun Moon Jung
Korea Energy Agency (KEA)
Policy Team Manager
Korea Energy Agency
388 Poeun-Daero. Suji-Gu,
Yongin-Si,
Gyeonggi-Do, 16842
Telephone: (82) 31 260 4181
Mobile: (82) 10 4220 3447
Telefax: (82) 31 260 4189
E-mail: jsmoony@energy.or.kr

Ms. Su-Hyeon Jung*
Korea Energy Agency (KEA)
388 Poeun-Daero. Suji-Gu,
Yongin-Si,
Gyeonggi-Do 16842
Telephone: (82) 31 260 4184
Telefax: (82) 31 260 4189
Mobile: (82) 10 4741 1310
E-mail: suhyeonco@energy.or.kr
mailger89@gmail.com

NETHERLANDS

Ms. Gerdien de Weger*
Adviseur Energie Innovatie
Netherlands Enterprise Agency
Croeslaan 5, 3521 BJ Utrecht
Telephone: (31) 886 027 102
Mobie: (31) 615 873 747
E-mail: gerdien.deweger@rvo.nl

Mr. Harry Vreuls*
Netherlands Enterprise Agency
Department of International Innovation
Box 965
Slachthuisstraat 71
6140 CB Roermond
Telephone: (31) 886 022 258
Telefax: (31) 886 029 021
Mobile: (31) 630 608 163
E-mail: harry.vreuls@rvo.nl

NEW ZEALAND

Vacant (TBC)

Dr. Sea Rotmann
SEA-Sustainable Energy Advice
43 Moa Point Road
6022 Wellington
Telephone: (64) 4380 7374
Mobile: (64) 212 469 438
E-mail: drsea@orcon.net.nz
Twitter: @DrSeaRotmann
Facebook: DrSea Rotmann
LinkedIn: Dr Sea Rotmann

NORWAY

Mr. Even Bjørnstad*
Enova SF
Postboks 5700 Torgarden
N-7437 Trondheim
Telephone: (47) 73 19 04 30
Mobile: (47) 99 638218
E-mail: even.bjornstad@enova.no

SPAIN

Ms. Susana Bañares
RED Eléctrica de España
Plaza del Conde de los Gaitanes, 177
La Moraleja 28109 Alcobendas, Madrid
Telephone: (34) 91 659 99 35
Telefax: (34) 91 650 4542
E-mail: sbanares@ree.es

SWEDEN

Dr. Mehmet Bulut*
Swedish Energy Agency
Box 310
SE-631 04 Eskilstuna
E-mail: Mehmet.bulut@energimyndigheten.se

SWITZERLAND

Mr. Markus Bareit
Departement für Umwelt, Verkehr,
Energie und Kommunikation
Swiss Federal Office of Energy
Mühlestrasse 4, 3003 Bern
Telephone:
Telefax:
E-mail: markus.bareit@bfe.admin.ch
www.bfe.admin.ch

Mr. Klaus Riva
Swiss Federal Office of Energy
3003 Bern
Telephone: (41) 31 322 5706
E-mail: Klaus.riva@bfe.admin.ch

UNITED KINGDOM

Dr. Peter Warren*
International Climate and Energy
Department for Business, Energy & Industrial Strategy
1 Victoria Street
London, SW1H 0ET
United Kingdom
Telephone: (44) 300 068 6984
Email: peter.warren@beis.gov.uk

Mr. David Shipworth*
UCL Energy Institute
Central House, 14 Upper Woburn Place
WC1H 0NN London
United Kingdom
Telephone: (44) 118 378 7177
Telefax: (44) 118 931 3856
E-mail: d.shipworth@ucl.ac.uk

UNITED STATES

Mr. Larry Mansueti
Director, State and Regional Assistance
Office of Electricity Delivery
and Energy Reliability
U.S. Department of Energy
1000 Independence Ave. SW,
Washington D.C. 20585
Telephone: (1) 202 586 2588
Telefax: (1) 202 586 5860
E-mail: lawrence.mansueti@hq.doe.gov

SPONSORS

Regulatory Assistance Project (RAP)
Mr. Jan Rosenow
Regulatory Assistance
Project (RAP)
Rue de la Science 23
1050 Brussels, Belgium
Telephone:
Mobile: (44) 7722 343137
E-mail: jrosenow@raponline.org

Mr. Frederick Weston
Regulatory Assistance
Project (RAP)
The Energy Foundation – Beijing Office
CITIC Building Room 2504
No 19 Jianguomenwai Dajie
1000004 China
Cina Mobiel: +136 9332 6094
E-mail: rweston@raponline.org

European Copper Institute

Mr. Hans De Keulenaer
European Copper Institute
Avenue de Tervueren 168 B10
1150 Brussels, Belgium
Telephone: (32) 2 777 7084
Telefax: (32) 2 777 7079
E-mail: hans.dekeulenaer@copperalliance.eu
www.eurocopper.org

Mr. Philip Zhang
International Copper
Association
Beijing Office
Room 2605-2608 Tower A Bldng 1
Tianzou International Center
No.12 Zhongguancun South Ave
Haidian District, Beijing, 100081
Telephone: (86) 10 6804 2450 203
Telefax: (86) 10 6802 0990
Mobile: (86) 139 1008 2556
E-mail: philip.zhang@copperalliance.asia
www.copperalliance.asia

EfficiencyOne (Nova Scotia (Canada))

Ms Sarah Mitchell
Energy Efficiency Nova Scotia – Efficiency One
230 Brownlow Avenue, Suite 300
Dartmouth, NS B3B 0G5
Nova Scotia, Canada
Telephone: (902) 470 3584
Telefax: (902) 470 3599
E-mail: SMitchell@efficiencyns.ca

Mr. Chuck Faulkner
Energy Efficiency Nova Scotia – Efficiency One
230 Brownlow Avenue, Suite 300
Dartmouth, NS B3B 0G5
Nova Scotia, Canada
Telephone: (902)
Telefax: (902)
E-mail: cfaulkner@efficiencyone.se

Mark Robertson*
Energy Efficiency Nova Scotia – Efficiency One
230 Brownlow Avenue, Suite 300
Dartmouth, NS B3B 0G5
Nova Scotia, Canada
E-mail: MRobertson@efficiencyns.ca

ADVISOR TO EXCO

Mr. Hans Nilsson
Grubbensringen 11
112 69 Stockholm
Sweden
Telephone: (46) 8 650 6733
E-mail: nosslinh@telia.com



**CHAIRMAN and EXECUTIVE COMMITTEE
SECRETARY**

Ms. Anne Bengtson*
Grindtorps Skolgränd 28, 183 47 Täby
Sweden
Telephone: (46) 70 7818501
E-mail: anne.bengtson@telia.com

SPOTLIGHT/NEWSLETTER EDITOR

Ms. Pamela Murphy
KM Group
9131 S.Lake Shore Dr.
Cedar, MI 49621
United States
Telephone: (1) 231 228 7016
Telefax: (1) 231 228 7016
E-mail: pmurphy@kmgrp.net

IEA SECRETARIAT

Mr Jeremy Sung*
9 rue de la Fédération
75739 Paris Cedex 15
Telephone:
Telefax:
E-mail: jeremy.sung@iea.org

WEB MAINTENANCE

Mr. Karl Weber
Weber Web Ltd (WeberWeb)
43 Moa Point Road
Moa Point
6022 Wellington
New Zealand
Mobile: (64) 22 693 5134 or (61) 417 396 352
E-mail: karl.weber@gmail.com

OTHER ATTENDEES

Mr. Rob Kool*
Netherlands Enterprise Agency
Croeselaan 15
P.O. Box 8242
3521 BJ Utrecht
The Netherlands
Telephone: (31) 886 022 503
Telefax: (31) 886 029 025
Mobile: (31) 646 424 071
E-mail: rob.kool@rvo.nl

DSM Implementing Agreement on Demand Side Management Technologies and Programmes – Operating Agents

* Participated at the Executive Committee meeting 17-18 April, Bergen, Norway

Task 16 – Energy Performance Contracting - Competitive Energy Services - Operating Agent

Mr. Jan W. Bleyl-Androschin*
Graz Energy Agency
Kaiserfeldgasse 13/1
A-8010 Graz, Austria
Telephone: (43) 316 811848 -20
Telefax: (43) 316 811848 – 9
Mobile: (43) 650 799 2820
E-mail: energeticsolutions@e-mail.de

Task 17 – Integration of Demand Side Management, Distributed Generation, Renewable Energy Sources and Energy Storages - Operating Agent

Mr. René Kamphuis*
TNO, Netherlands Organization for
Applied Scientific Research/Energy
Efficiency and ICT Program
PO Box 1416, 9701 BK Groningen
The Netherlands
Telephone: (31) 621134424
E-mail: rene.kamphuis@tno.nl
www.tno.nl

Dr. A. M. (Anna) Kosek*
Group Monitoring and Control Services,
TNO/ the Hague
Anna van Buerenplein 1
2595 DA Den Haag
Postal address
Postbus 96800
2509 JE Den Haag”
The Netherlands
E-mail: anna.kosek@tno.nl

Task 24 – Closing the loop: Behaviour change in DSM – Helping the behaviour changers Operating Agent

Dr. Sea Rotmann (via Skype)
43 Moa Point Road
6022 Wellington
New Zealand
Telephone: (64) 4 380 7374
Mobile: (64) 212 469 438
E-mail: drsea@orcon.net.nz
Twitter: @DrSeaRotmann
Facebook: DrSea Rotmann
LinkedIn: Dr Sea Rotmann



**Task 25 – Business models for a More Effective Uptake of DSM Energy Services
Operating Agent**

Dr. Ruth Mourik*
Eschweilerhof 57
5625 NN Eindhoven
The Netherlands

Telephone: (31) 40 242 5683
Mobile: (31) 6 2507 5760
E-mail: info@dunetworks.nl

Renske Bouwknegt

Telephone: (31) 63 889 1557
E-mail: renske@ideate.nl

Glossary

Abbreviation	Explanation
APEC	Asia-Pacific Economic Cooperation
BCG	Buildings Co-ordination Group (consists of 7 Implementing Agreements)
CERT	Committee on Energy Research and Technology in the IEA
CIGRE	International Council on Large Electric Systems
CTI	Implementing Agreement on Climate Technology Initiative
DHC	Implementing Agreement on District Heating and Cooling
DSM	Implementing Agreement on Demand-Side Management
EC	European Commission
ECEEE	European Council for an Energy Efficient Economy
ECES	Implementing Agreement on Energy Storage
ECI	European Copper Institute
EEWP	Energy Efficiency Working Party in the IEA
ENARD	Electricity Networks Analysis, Research & Development
EOT	End of Term
ESD	Energy Services Directive in the European Commission
ETE	Energy Technology Essentials (3-4 page briefs)
ETSO	European Transmission System Operators
EU	European Union
EUWP	End-Use Working Party in the IEA
FBF	Implementing Agreement on Future Buildings Forum
GHG	Green House Gas
HPC	Implementing Agreement on Heat Pump Centre
ICLEI	International Council for Local Environmental Initiatives
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
ISGAN	International Smart Grid Action Network (ISGAN)

JFS	Japan Facility Solutions (Japanese Sponsors participating in Task XVI)
KEA	Korea Energy Agency
KIER	Korea Institute of Energy Research
NEET	New and Emerging Environmental Technologies (IEA networking project - Gleneagles G8)
NDRC	National Development and Reform Commission, China
PMD	Pre-Meeting Document
PVPS	Implementing Agreement on Photovoltaic Power Systems
REEEP	Renewable Energy and Energy Efficiency Partnership
SANEDI	South African National Energy Development Institute
SANERI	South African National Energy Research Institute
SHC	Implementing Agreement on Solar Heating and Cooling
TSO	Transmission System Operators

If you would like to add to the glossary send your suggestion to anne.bengtson@telia.com

Executive Committee meetings of the IEA DSM TCP initiative

(table excludes the European Union)

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	London, United Kingdom		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	2	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		