

*Phase IV: Life-Cycle Costing;
'Deep Retrofit'; Simplified M&V;
Crowd-Financing for EE & RE projects
& Energy Services Taxonomy*

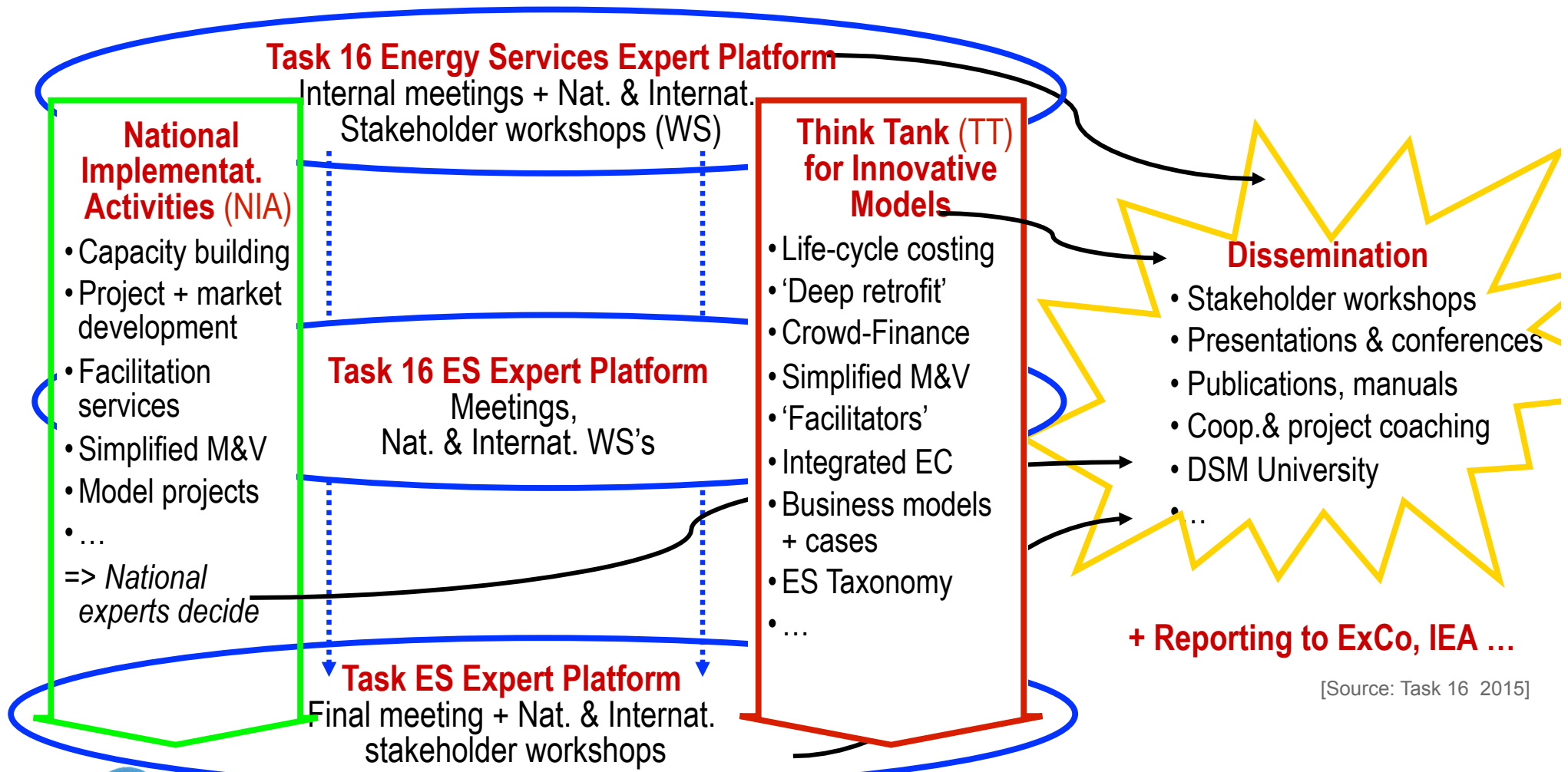
Task Status Report
49th IEA DSM ExCo Meeting
Dublin, Ireland, May 10-12, 2017

Jan W. Bleyl, Task 16 Operating Agent

Task 16 in a nutshell

- 1. Innovations in performance-based Energy Services (ES):**
=> Think Tank, e.g. sM&V, Facilitators, IEC ...
- 2. Task 16 Energy Services Expert Platform:**
=> Meetings, mutual coaching & invite guests ...
- 3. National implementation activities (NIA)**
=> Individual ES market development in each country
- 4. Dissemination of results:**
=> Publications, stakeholder workshops, DSM-University ...

Task 16 structure



[Source: Task 16 2015]

Executive Summary

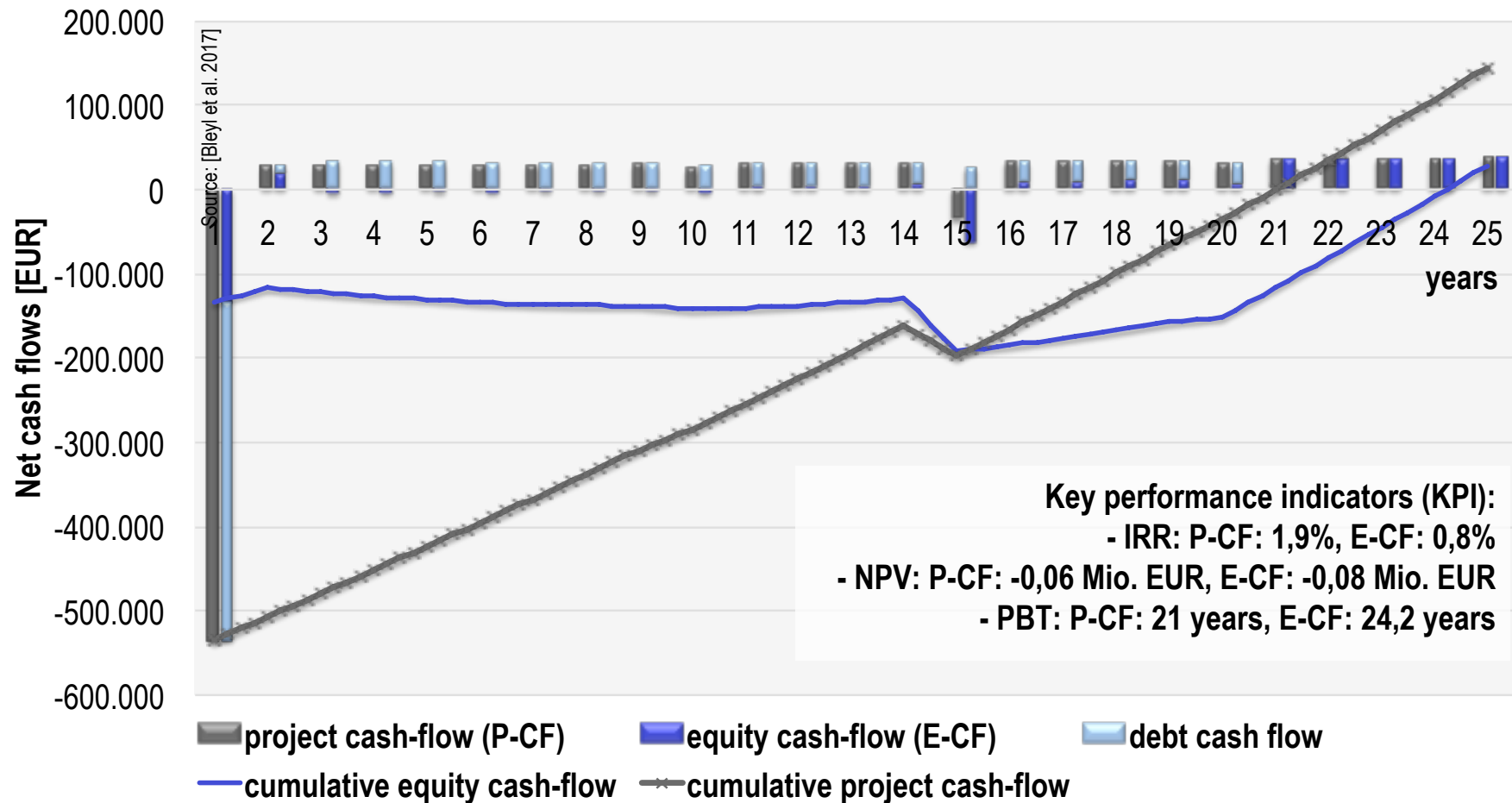
- 1. Participants:** Belgium (*since 2016*), Canada (*in kind*), Germany (*coop. Annex 61*), GIZ (*for 9 m*), Netherlands, Norway, Switzerland
- 2. Budget: 181.700,- EUR** (+30.000 EUR thanks to Belgium): **57% spent**
- 3. Think Tank** key accomplishments in last 6 month:
 - ⇒ Joint paper “**Building Deep Energy Retrofits: Using Dynamic Cash Flow Analyses and Multiple Benefits to Convince Investors**”
Accepted for publication at ECEEE summer studies ‘17.
In close cooperation with all Task 16 experts + IEA ECB Annex 61
 - ⇒ **sM&V** (simplified M&V): 2nd journal submission with Efficiency 1
- 4. Success story: Austrian Military** has decided to energetically renovate a military trainings grounds based on the Integrated Energy Contracting (IEC) model, which was developed in Task 16



A ,teaser‘ of our current work

***Building Deep Energy Retrofit:
Using Dynamic Cash Flow Analysis and Multiple
Benefits to Convince Investors***

DER case study: Net project, equity and debt cash flows (annual and cumulative)



[Source: Bleyl et al. 2017]

Multiple Benefits classification grid

		Difficulty of quantification	
		Easy	Difficult
Relevance to business case	High	<p>Recommended approach:</p> <ul style="list-style-type: none"> - Quantify, include in economic analyses if possible <p>Case Study examples:</p> <ul style="list-style-type: none"> - Maintenance costs - Rent/sale value 	<p>Recommended approach:</p> <ul style="list-style-type: none"> - Discuss with project stakeholders <p>Case Study examples:</p> <ul style="list-style-type: none"> - Employee productivity - "Green/Sustainable" image - Asbestos removal - Building aesthetics
	Low	<p>Recommended approach:</p> <ul style="list-style-type: none"> - Investigate for outside partnerships, quantify if necessary <p>Case Study examples:</p> <ul style="list-style-type: none"> - Avoided utility infrastructure - GHG emissions (due to carbon price) 	<p>Recommended approach:</p> <ul style="list-style-type: none"> - Investigate for outside partnerships <p>Case Study examples:</p> <ul style="list-style-type: none"> - Job creation - GHG emissions (societal value and local air quality) - Energy security

[Source: Bleyl et al. 2017]

Multiple Benefits of Deep Energy Retrofit (DER): Pecuniary values in EUR/m²/year and NPVs over 25 years

Multiple Benefits of DER	Range	Valuation	
		EUR/ (m ² * y)	NPV: EUR/m ²
1. Work productivity increase (0.3%)	Lower	8.0	169
	Upper	8.0	169
2a. Rental income increase (1 - 5.3%)	Lower	1.2	25
	Upper	6.4	134
2b. Building sales price increase (2.5 - 6.5%)	Lower	100	
	Upper	260	
3. CO₂ savings (5 - 79 EUR/t)	Lower	0.2	5
	Upper	3.8	79
4. Maintenance cost savings (2.1-3 EUR/m²/y)	Lower	2.1	44
	Upper	3.0	63
5a. Energy cost savings project term (25 years)	Lower	16.8	354
	Upper	16.8	354
5b. Add. energy cost savings over techn. lifetime (40 y)	Lower	16.8	157
	Upper	16.8	157

[Source: Bleyl et al. 2017]

Multiple Benefits of DER: Pecuniary Values and their Accountability to Different Stakeholders

Multiple Benefits of DER				Valuation		Beneficiaries			
				Range	EUR/ (m ² * y)	NPV: EUR/m ²	Different owner perspectives		
				Property develop.	Occupant -owner	Lessor -owner			
1.	Work productivity increase (0.3%)	Lower	8.0	169	-	169	-	169	
		Upper	8.0	169	-	169	-	169	
2a.	Rental income increase (1 - 5.3%)	Lower	1.2	25	-	-	25	-25	
		Upper	6.4	134	-	-	134	-134	
2b.	Building sales price increase (2.5 - 6.5%)	Lower		100	100	[100]	[100]	-	
		Upper		260	260	[260]	[260]	-	
3.	CO ₂ savings (5 - 79 EUR/t)	Lower	0.2	5	-	5	-	5	
		Upper	3.8	79	-	79	-	79	
4.	Maintenance cost savings (2.1-3 EUR/m2/y)	Lower	2.1	44	-	44	44	-	
		Upper	3.0	63	-	63	63	-	
5a.	Energy cost savings project term (25 years)	Lower	16.8	354	-	354	-	354	
		Upper	16.8	354	-	354	-	354	
5b.	Add. energy cost savings over techn. lifetime (40 y)	Lower	16.8	157	-	157	-	[157]	
		Upper	16.8	157	-	157	-	[157]	
Totals				Lower NPV:	100	729	69	503	
				Upper NPV:	260	822	197	468	

Source: [Bleyl et al. 2017]

[Source: Bleyl et al. 2017]



Activities + goals for next 6 month (cont'd)
Dissemination & cooperation (subtask 22)

- ✓ *Next Task 16 IEA DSM Webinar:*
Deep Energy Retrofits: Using Dynamic Cash Flow Analysis and Multiple Benefits to Convince Investors

=> When would be a good time, Hans²: (3rd or 4th Q 2017)?

Task 16 Budget vs. Expenditures

(as of 1 April 2017 excl. VAT)

Subtasks <i>unit</i>	Total budget <i>EUR</i>	Cumulative spending <i>EUR</i>	% spent <i>%</i>	Remaining <i>EUR</i>
19 Energy Services Expert Platform	22.000	11.880	54%	10.120
20 Think Tank for innovative Energy Services	73.920	46.640	63%	27.280
21 Coaching of National Implementation Activities	14.520	8.800	61%	5.720
22 Dissemination & Cooperation (international + national)	15.840	8.712	55%	7.128
23 Management & Reporting (to ExCo)	37.840	19.800	52%	18.040
Subtotals	164.120	95.832	58%	68.288
Travel costs	14.700	7.497	51%	7.203
Other costs	2.880	0	0%	2.880
Totals	181.700	103.329	57%	78.371

⇒ Spending of last reporting period: **52,428 EUR**, adding to a total expenditure of **103,329 EUR** (= 57% of total budget)

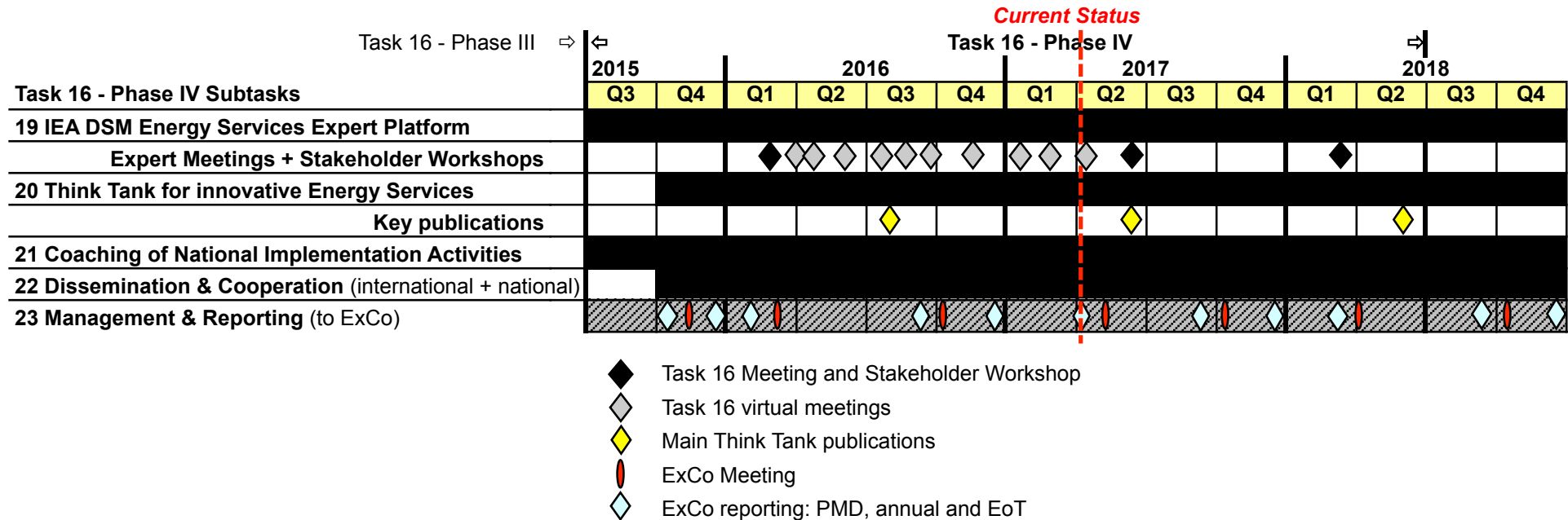
⇒ Income during last reporting period: **45,000 EUR** (against **45,000 EUR billed**),
Total income: **106,700 EUR** (= 59% of total budget)

Task 16 - Phase IV

Activity time schedule update

Phase IV has started operation on 01 July 2015 and will end 30 June 2018

Task 16 - Phase IV Timetable (as of April 2017)





Matters for the ExCo

- 1. Approve the Task Status Update Report**
- 2. Provide guidance on future work after June 2018,
if desired by the ExCo?**

Ideas for new work of the TCP

1. We would like to flag the topic of **Multiple Benefits** (MB) again. As we probably all agree, MBs offer very interesting perspectives on demand side energy efficiency and renewables and the opportunity to identify drivers and strategic allies for DSM programs and projects.
2. This approach is further encouraged by our work: In our recent paper we have developed a rather straight forward methodology how to factor MBs into a building Deep Energy Retrofit investment calculation by taking a look from a bottom up case study perspective. This approach could probably be transferred to other DSM topics as well. Results are turning out to be very interesting (among others with regard to the split incentive dilemma, where to put priorities and also for policy design).
3. This recent work reinforces my conviction that it is worthwhile and needed to put more applied research into MBs and that the DSM TCP could and should put it back on its agenda. If desired by the ExCo, Task 16 would be happy to help revitalize Task 26 (or any another format).

**ENERGETIC
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JAN W. BLEYL

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Task 16 'Innovative Energy Services'

***Thank you very much
for your continued support!***

Operating Agent contacts:

Jan W. Bleyl – Energetic Solutions

Lendkai 29, 8020 Graz, Austria

Tel: +43 650 7992820

Email: EnergeticSolutions@email.de

For more information, visit www.ieadsm.org