ieadsm energy efficiency

Task 16 "Energy Services"

www.ieadsm.org

IEA-DSM, Task 16 (Phase III): "Innovative Energy Services"

(ESCo-Services, Energy-Contracting)

Task Status Report to ExCo

March 26th 2015, Cape Town, SA

Jan W. Bleyl – Energetic Solutions, Austria and Germany

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Swiss Federal Office of Energy SFOE

ENERGETIC SOLUTIONS

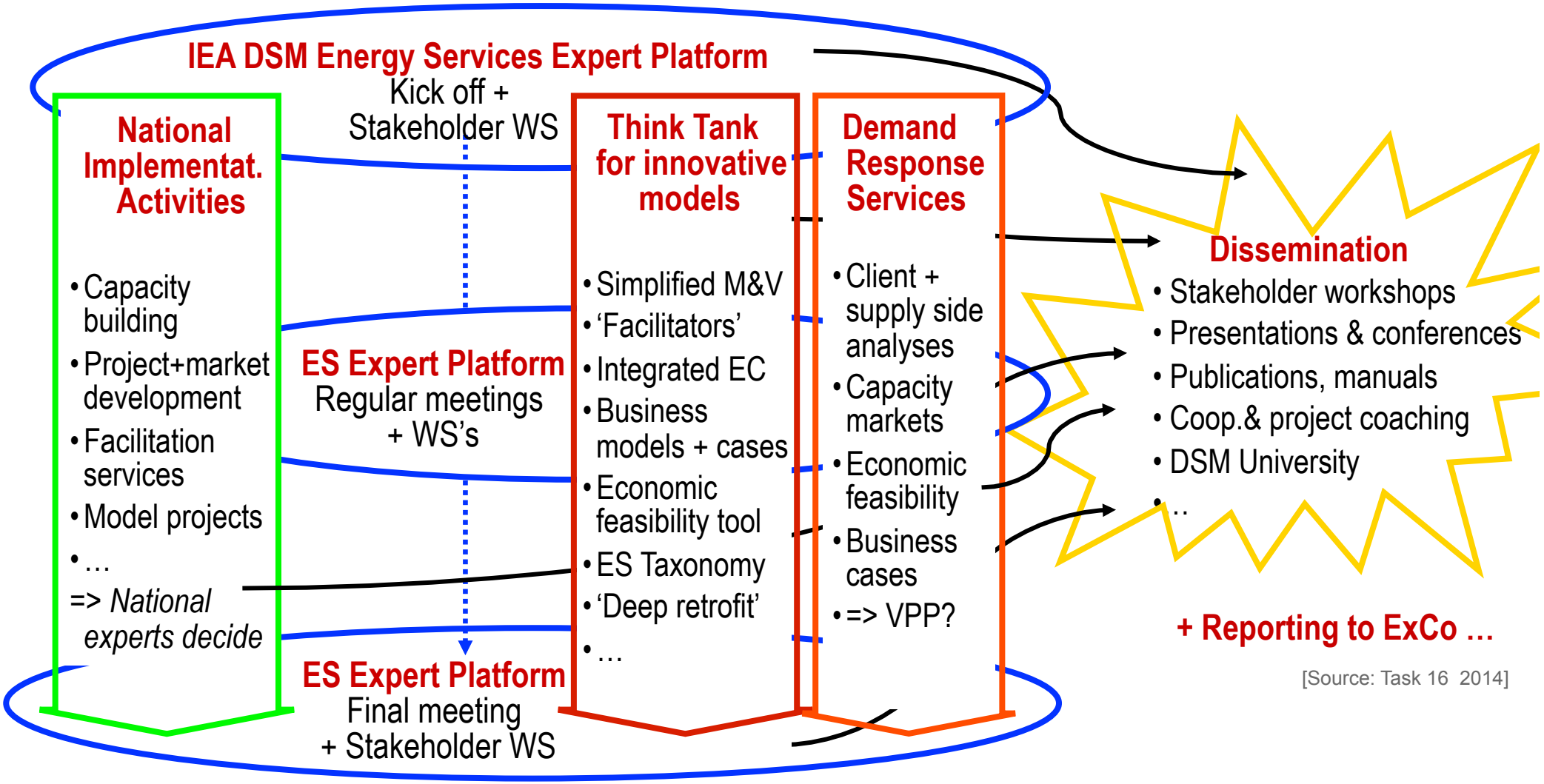
JAN W. BLEYL

Executive Summary

1. ***Outreach*:**
   - **Korea**: Stakeholder workshop with 90 participants
   - **China**: Financing of Energy Efficiency, Life Cycle Cost calculations
   - **EMCA** (Chinese ESCo association): Bankable project appraisal
   - **IPMVP**: Board request for cooperation on simplified M&V
   - **Fh Pinkafeld** (applied science university): Master class on energy services
   - **South Africa**: ESCo training for bankable project calculation and financing
2. ***Think Tank***:

   ⇨ **Simplified measurement & verification + quality assurance instruments for energy, water and CO_2 savings** (ECEEE'14)
   => German version published by dena (German Energy Agency, March'15)
3. ***Budget*: 83% spent after 31 month** (out of 36 m.) => in-line with planning
4. ***Outlook:*** Task 16 to be continued? => **guidance from ExCo needed!**

Task 16 Structure



[Source: Task 16 2014]

Accomplishments since last meeting

Accomplishments since last meeting
Energy Service Expert Platform (subtask13)

- ✓ **17th experts meeting held in Seoul, Korea, 23-24 October 2014**.
  The main agenda items were presentation and discussion of national implementation activities, discussions on current Think Tank topics and dissemination activities.

- ✓ **Preparation of the 18th experts meeting**, to be held in France (back to back with ECEEE summer studies)

Energy Service Expert Platform + Dissemination (subtasks 13+17)

- ✓ **17th Task 16 stakeholder workshop in Seoul, Korea 22 October 2014:**
  - ⇨ *Morning session:* **Good examples of ESCo in industry, public and building sectors**
  - ⇨ *Afternoon session:* **Selected Think Tank results, Policies and examples of European ESCos and Chinese ESCo market situation**

- ✓ Preparation of the **18th Task 16 stakeholder workshop** to be held in **Switzerland** in fall 2015 (exact date and topic tbd)

Accomplishments since last meeting (cont'd)
Think Tank (subtask 14)

Work continued on:

- ✓ A Task 16 discussion paper on **Simplified measurement & verification + quality assurance instruments for energy, water and CO_2 savings**. Methodologies and examples. Including examples and national perspectives of Task 16 experts
- ✓ **Business models for comprehensive building refurbishment** ('deep retrofit') in cooperation with IEA ECB Annex 61: Application of the economic feasibility evaluation tool to several case studies, e.g. in Denmark, Germany and Austria
- ✓ Drafting of a **Taxonomy paper on Energy Services** to be published in a peer-reviewed journal in cooperation with Linköping University

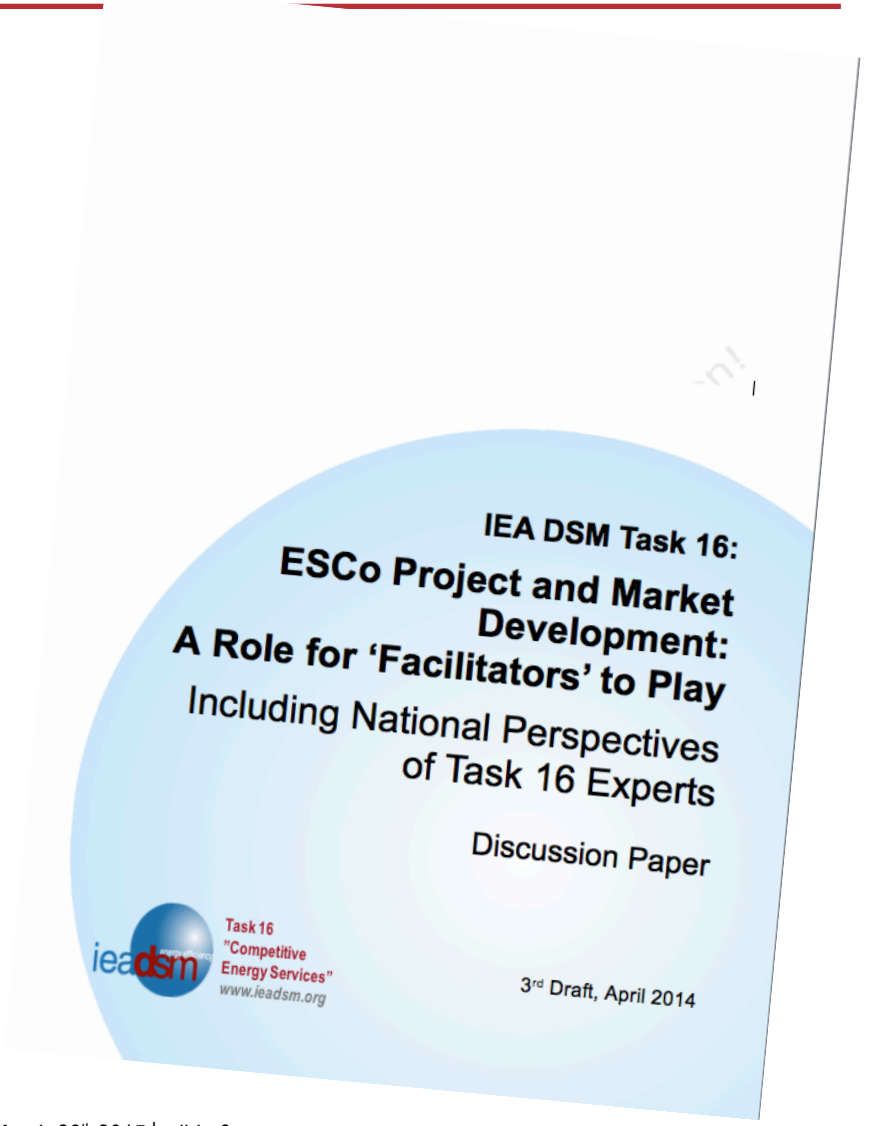
Task 16 Discussion Paper on Facilitators incl. national perspectives

ESCo Project and Market Development: A Role for 'Facilitators' to Play. Including National Perspectives of Task 16 Experts

by Task 16 experts **Adilipour; Bareit; Bleyl; Coolen; Jang, Hye-Bin; Kempen; Ungerböck**
with guest contributions by **Lohse**, KEA; **Borchard**, **Zellner**, GIZ

Task 16 discussion paper, May 2014

Download available from www.ieadsm.org => Task 16



Task 16 paper on Simplified Measurement and Verification (M&V) of savings

Bleyl, Jan W. et.al
Simplified measurement & verification + quality assurance instruments for energy, water and CO_2 savings. Methodologies and examples accepted for publication at ECEEE Industrial Summer Study, paper ID 1-088-14, Arnhem, the Netherlands June 2014

by **Bareit; Bleyl; Sattler** and with **inputs from Task 16 experts**

Simplified measurement & verification + quality assurance instruments for energy, water and CO_2 savings. Methodologies and examples

Jan W. Bleyl
IEA DSM Task 16 c/o Energetic Solutions
Lendkai 29, 8020 Graz, Austria or Frankfurterstr. 12, 76344 Leopoldshafen, Germany
EnergeticSolutions@email.de

Markus Bareit
Swiss Federal Office of Energy (SFOE)
3003 Bern, Switzerland
markus.bareit@bfe.admin.ch

Peter Sattler
sattler energie consulting gmbh
Krottenseestraße 45, 4810 Gmunden, Austria
Sattler@energie-consulting.at

1. Abstract

Measurement & Verification (M&V) is a prerequisite to assess the quantitative outcomes of energy, water or CO_2 saving measures and to translate these into savings cash flows for energy efficiency financing and other purposes.

In practice M&V - if pursued at all in the case of in-house implementations – is often complicated by limited data availability or accuracy, a limited comparability between 'Baseline' and 'Reporting' periods or a lack of a clear M&V plan and having the resources to follow it up. If accomplished, understanding M&V reports requires expertise, which is not necessarily available on the facility owner side. To make things worse, exercising M&V is a rather boring topic - even within the professional energy community.

At least in many European countries, commonly acknowledges methods for M&V of energy, water or CO_2 savings are mostly based on utility meters and invoices – whereas in Anglo-Saxon influenced markets 'retrofit isolation techniques' for individual saving measures are accepted as good practice for the verification of energy savings cash flows (e.g. IPMVP Options A or B).

All of the aforementioned adds to the inherently complex nature of energy efficiency projects. And it often results in insecurity for energy managers, project developers, ESPs and their (potential) ESP customers and financiers on verifiable future energy savings cash flows, which may lead to risk surcharges or no project implementation at all. Yet a full scale M&V plan is often not applicable or desired, due to its (perceived) complexity, lack of resources or its cost is prohibitive for smaller projects.

As a possible solution and feasible compromise between no M&V at all and the (perceived) accuracy of a full scale M&V approach, this paper will introduce simplified M&V approaches for individual or groups of electricity, heat, water or CO_2 saving measures (ECM), which can

Demand Response Services business models (subtask 15)

- ✓ Analyses finalized of **Austrian capacity markets** and framework (by e7)
- ✓ Development of a **simplified capacity market DR revenue model** for Austria to conduct feasibility analyses of business cases finalized
- ✓ Analyses of **end-use sectors** in Austria and preparation of a cement industry business case study (by e7)
- ✓ Finalization of a full paper on **Economic feasibility of DR business models** for publication at Internationale Energiewirtschaftstagung 2015

Accomplishments since last meeting (cont'd)

Coaching of individual National Implementation Activities (subtask 16)

- ✓ Implementation of the individual NIA plans to develop know how and energy service markets were followed up, the experts gave detailed presentations and exchanged experiences and good practices during the last platform meeting and through teleconferences in between meetings

Dissemination and cooperations (subtask 17, selection)

- ✓ **Economic evaluations to communicate between technicians and management. Methods, calculation and examples – an introduction**. Seminar for energy technicians in industry (Nov. 2014)
- ✓ ESCo manager trainings in Pakistan in coperation with GIZ: **Investment grade Calculation, Analyses & Financing of ESCo Projects (for EPC and ESC Business Models). Introduction & hands-on training** in Lahore, Pakistan (Dec. 2014)
- ✓ Presentation of an '**ESCo University**' as a pre-conference workshop and the ‚**Facilitator**' **approach** at the ESCo Europe conference 2015 in Milan (January 2014)
- ✓ Know how transfer + supervision for **start-up ESCo in Croatia** => **1 Mw_{el} wood chip gasification + CHP** for heat & green electrictiy supply project (3,5 – 4,0 Mio EUR investment)

Dissemination and cooperations (subtask 17, cont'd)

- ✓ **FH Pinkafeld** applied science university
  => Master class on performance-based Energy Services (01-03/2015)
- ✓ **German-Chinese Energy Dialogue on Financing of Energy Efficiency** in China: Life Cycle Cost Appraisal and Calculation Methodologies for Energy Efficiency Projects (February 2015)
- ✓ **ESCO Committee of China Energy Conservation Association** (EMCA): Bankable project calculation (February 2015)
- ✓ Co-operation with other ongoing energy service projects (selection)
  - **EBC Annex 61** => Deep retrofit business models
    => Feasibility assessment of model projects
  - **Linköping University** => ES taxonomy and other topics
  - **dena** (German Energy Agency) => Simplified M&V guidebook
- ✓ **South Africa: eThekwini Municipality** => pilot project facilitation
  Cape Town => Bankable project calculation for ESC projects (March '15)

dena-Praxishilfe. Einsparnachweise im Energiespar-Contracting (Germany)

dena (German Energy Agency)
dena-Praxishilfe
Einsparnachweise im Energiespar-Contracting
(M&V for Energy Services, focus on simplified approaches)

by **Bleyl; Holz; Schenker**, March 2015

=> builds on our ECEEE 2014 paper, with reference to Task 16

Other national versions?

Activities + goals for next 6 month

Activities + goals for next 6 month
Energy Service Expert Platform (subtask13)

- ✓ Execution of the **18th experts meeting, to be held in in France** May 30 – June 1 2015 (back to back with ECEEE summer studies). The main agenda items will be presentation and discussion of national implementation activities, discussions on current Think Tank topics and dissemination activities
- ✓ Preparation of the **19th experts meeting**, to be held in **Switzerland** in fall 2015 (exact date tbd)

Activities + goals for next 6 month (cont'd)

Energy Service Expert Platform + Dissemination (subtasks 13+17)

- ✓ Execution of the **18th Task 16 stakeholder workshop** to be held in **France** back to back with ECEEE summer studies (exact topic tbd)
- ✓ Preparation of the **19th Task 16 stakeholder workshop** to be held in **Switzerland** in fall 2015 (exact date and topic tbd)

Activities + goals for next 6 month (cont'd)
Think Tank (subtask 14)

- ✓ Finalize work on Task 16 discussion paper **Simplified measurement & verification + quality assurance instruments** for energy, water and CO_2 savings. Methodologies and examples. Including examples and national perspectives of Task 16 experts
- ✓ **Business models** for **comprehensive building refurbishment** ('deep retrofit'): Application and further development of an economic feasibility evaluation tool including sensitivity analyses for deep retrofit business cases. Application of the tool for case studies in cooperation with IEA ECB Annex 61
- ✓ Submission of a **Taxonomy paper on Energy Services** to a peer-reviewed journal (either in Renewable & Sustainable Energy Reviews or Journal of Cleaner Production) in cooperation with Linköping University

Demand Response Services business models (subtask 15)

- ✓ Finalization of analyses of **potential end-use sectors** (**teritary sector**) in Austria and preparation of a **cement industry business case** (by e7)
- ✓ Finalization of a full paper on **Economic Feasibility of DR Business Models** for publication at Internationale Energiewirtschaftstagung (IEWT 2015)

Activities + goals for next 6 month (cont'd)

Coaching of individual National Implementation Activities (subtask 16)

- ✓ Continue implementation of individual NIA plans to develop know how and energy service markets
- ✓ To follow up, experts will give detailed presentations and exchange experiences and good practices during the next platform meeting and through teleconferences in between meetings

Activities + goals for next 6 month (cont'd)
Dissemination & cooperation (subtask 17)

Publications, presentations or workshops planned:

- ✓ **Co-operation** with other ongoing energy service projects and institutions:
  - **ECB Annex 61** => Deep retrofit feasibility analyses and business models
  - **IEA IETS Annex 16** Energy Efficiency in SMEs => business models
  - **Linköping University** => ES taxonomy and other topics
  - **FH Pinkafeld** - applied science university => Master class on energy services
  - **dena** (German Energy Agency) => Simplified M&V guidebook (in German language)
- ✓ **Economic appraisals** to communicate between technicians and management. Methods, calculation and examples – an introduction. Seminar for energy technicians in industry (December 2015)

Dissemination and cooperation (subtask 17 cont'd)

- ✓ **ESCo manager trainings** in Medenec, South Africa, Carrbiean in coperation with GIZ: Investment grade Calculation, Analyses & Financing of ESCo Projects (for EPC and ESC Business Models). Introduction & hands-on training
- ✓ Presentation of an '**ESCo university**' as a pre-conference workshop at the **ESCo Europe conference 2015** in Vienna (November 2015)
- ✓ Another Task 16 **Leonardo ENERGY IEA DSM University webinar**?

Activities + goals for next 6 month (cont'd)

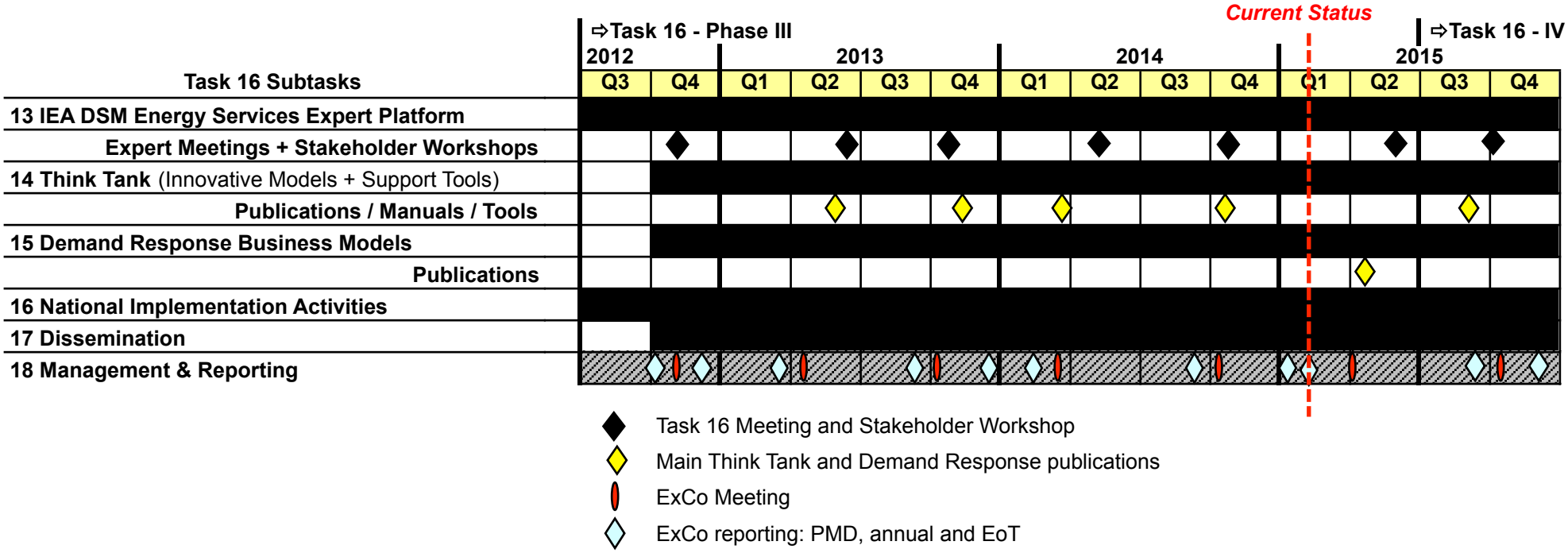
Dissemination (subtask 17)

More Dissemination on an academic level?

- ✓ Energy Policy special issue?
- ✓ IEA DSM books?
- ✓ IEA secretariate books
- ✓ DSM university

Task 16 Schedule update

Task 16 - Phase III+IV Timetable (as of January 2015)



Time wise we have spent 31 months out of the 36-month project duration.
All scheduled events and reporting targets have been met.

Task 16 Budget vs. Expenditures

(as of January 2015 and based on 5.7 participating countries, excl. VAT)

Subtask unit	Total budget EUR	Cumulative spending EUR	% spent %	Remaining EUR
13 Energy Services Expert Platform	**36.000**	**29.200**	**81%**	**6.800**
14 Energy Services Think Tank	**87.000**	**73.000**	**84%**	**14.000**
15 Demand Response ES Business Plans	**27.200**	**21.200**	**78%**	**6.000**
16 Coaching of National Implementation Activities	**12.800**	**11.200**	**88%**	**1.600**
17 Dissemination (Internat. + Nat.)	**13.000**	**10.500**	**81%**	**2.500**
18 Management & Reporting	**42.000**	**34.400**	**82%**	**7.600**
Subtotals	**218.000**	**179.500**	**82%**	**38.500**
Travel costs	**28.000**	**23.200**	**83%**	**4.800**
Printing&other	**9.000**	**8.200**	**91%**	**800**
Totals	**255.000**	**210.900**	**83%**	**44.100**

=> After 31 months (out of the 36 month project duration)
83% of the budget has been spent and is in-line with planning.

Task 16 Budget vs. Expenditures (Summary)

- The **total spending of last six month was 41,300** EUR adding to **total expenditure of 210,900** EUR, which equals **83 % of the total budget**.
- The **income during last reporting period was 45,000** EUR (against 45,000 EUR billed). This adds to a **total realized income of 209,985** EUR against a **total budget of 255,000** EUR.

Matters for the ExCo

1. **Approve the Task Status Report**

Looking ahead … Task 16 Phase IV??!?

Task 16 to be continued after June 2015?

Diverse feed-back so far:

- Austria
- Belgium
- South Korea
- Netherlands
- Sweden
- Switzerland
- GIZ
- Task 25
- Others?

=> Guidance from ExCo needed!

Think Tank topics and research questions for Task 16 Phase IV

1. **Comprehensive refurbishment (‚Deep Retrofit', ‚NZEB')**
   - **Economic feasibility** and opportunity cost?
   - **Investment grade calculation** and **financing** (business cases)?
   - **Business models**? How to factor in **non-energy-benefits** (NEB)?
2. **Energy services Taxonomy journal paper**
3. **Demand response business models** (cont'd) + **Demand response services and VPP** (market analyses, economic feasibility)
4. **Knowledge transfer to emerging and developing markets:** Relevance, methodologies, lessons learned **(GIZ)**
5. **Financing: Crowd-financing, funds** for EE and RES investments, e.g.
   - Access to CAPEX for smaller projects in SME and communities?
   - How to to bridge in particular the mezzanine financing gap?
6. Further contributions to the **DSM university**
7. **…** + further **Task 16 expert suggestions**

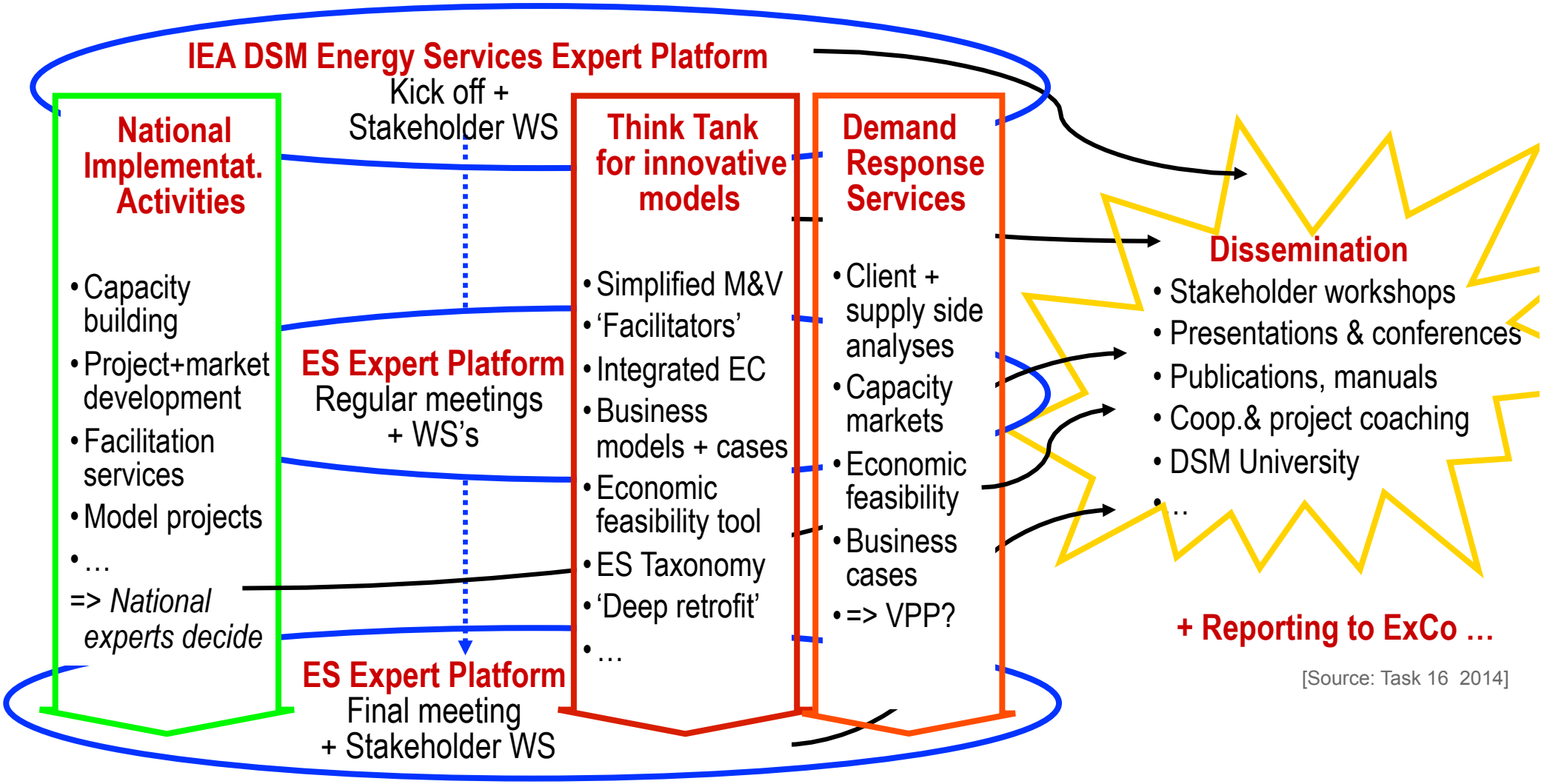
Think Tank topics and research questions
for Task 16 Phase IV (1/2)

1. **Comprehensive refurbishment (‚Deep Retrofit', ‚NZEB')**
   through Enery Services (in coop. with EBC Annex 61)**:**
   - **Economic feasibility** and **opportunity cost to wait**?
   - **Investment grade calculation** & **financing** (business cas
   - **Business models advancement with stakeholders including financiers**
   - How to factor in **Multiple Energy Benefits**?
   - Policy implications / recommendations
2. **Energy Services Taxonomy for academic journal paper**
3. **Demand response business models** (cont'd) + **Demand response services and VPP** (market analyses, economic feasibility)

Think Tank topics and research questions
for Task 16 Phase IV (2/2)

4. **Knowledge transfer to emerging and developing markets:**
   Methodologies, lessons learned for project & market develop ...
5. **Life Cycle Costing and economic rationale of EE and RES:**
   - How to do to do Life Cycle Cost appraisals?
   - Investment-grade calculation => bankable projects + financing
   - Methodologies + real cases from different DSM applications
6. **Financing: Crowd-financing** for EE and RES investments, e.g.
   - Access to CAPEX for smaller projects in SME, communities?
   - How to to bridge in particular the mezzanine financing gap?
7. Further contributions to the **DSM university**
8. + further **ExCo** and **Task 16 expert suggestions?**

Continue with well established structure



[Source: Task 16 2014]

Task 16 Phase IV: **Required resources**

Cost + task sharing:

1. **Cost sharing: 14,500 EUR/a**
2. **Task sharing: 0,5 – 1 person month/a**

over a **three year project period**.

Matters for the ExCo

1. **Provide guidance on how to proceed with the different issues!**
2. **Assess interest?**
3. Interest provided: **Task the OA to prepare a Task Work Plan for a final ExCo (ballot) vote**

Documentation/update of ExCo vote

Task 16 needs ≥ 4 countries

Country	Vote	Country	Vote
Austria	**no**. this year?	Norway	**no**
Belgium	**maybe**	Saudi Arabia	**-**
Canada	**?**	South Africa	**?**
Finland	**?**	Spain	**-**
France	**-**	Sweden	**no**
India	**-**	Switzerland	**yes**
Italy	**-**	UK	**no**
Korea	**?**	US	**no**
Netherlands	**yes**	RAP	**no**
New Zealand	**no**	GIZ	**in kind**
Totals:	**Yes:**	**> Maybe:**	**No:**

Thank you very much!

PS: IEA DSM Task 16 - Phase III builds on work, which was previously led by Graz Energy Agency. Thank you GEA!

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Swiss Federal Office of Energy SFOE

ENERGETIC SOLUTIONS

JAN W. BLEYL