



Preparatory study for BACS

Intro

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Alan McCullough(RICARDO)
Policy officer EC: Georgios Takoudis**

**Brussels, DG ENER
3rd of March 2020**

Agenda



- » **10h00-10h05: Welcome and introduction to study (DG ENER)**
- » **10h05-10h15: Tour de table +agenda(VITO)**
- » 10h15-10h30: Overview of draft Task 1 work (VITO)
- » 10h30-10h45: Task 1 Q&A on functional unit and scope
- » 10h45-11h00: Overview of initial draft Task 2 work (Waide)
- » 11h00-11h20: Overview of initial draft Task 3 work (VITO)
- » 11h20-11h30: coffee break
- » 11h30-11h50: Overview of initial draft Task 4 work (Ricardo)
- » 11h50-12h00: Overview of initial draft Task 5 work (VITO))
- » 12h00-12h20: Discussion on the base case selections (VITO)



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2

Agenda



- » 12h20-13h30: Lunch Break
- » 13h30-14h00: Discussion of approach and applicable market data to scale-up the base cases to derive the EU27 impact (Waide/VITO)
- » 14h30-14h50: Discussion of selected improvement options for Task 4/6 (Ricardo/VITO)
- » 14h50-15h20: Discussion of approach and data sources to model improvement options for Task 4/6 including life time and self-consumption(Ricardo/VITO)
- » 15h20-15h30: coffee break
- » **15h30-16h00: AOB (all)**
- » 16h00-16h15: conclusions and next steps (VITO/DG ENER)

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3

Presentation of the study team

Name	Position
Paul Van Tichelen	Contract and project manager, technical team leader
Tatiana Pasquel Garcia	Framework Contract Manager
Jan Verheyen	Senior expert technical building systems
Ma Yixiao	Junior expert technical building systems
Stijn Verbeke	Senior expert building modelling
Glenn Reynders	Junior expert building modelling
Ana Gonçalves Soares	Junior expert product policy
Dominic Ectors	Senior expert interoperability and smart grids
Chris Nuttall	Product policy
Kevin Bowe	Building expert, Energy efficiency
Alan McCullough	Product policy, modelling
Paul Waide	Quality Manager and senior expert

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4

Tour de table

- » Please note that this meeting will be recorded for the minutes of meeting
- » Use the buttons to raise a question
- » Today are about 60 participants – tour de table –(name and affiliation)
- » For commenting in writing please sent your comments to, by preference use the appropriate form
- » All info is on the project website: <https://ecodesignbacs.eu>
- » Powerpoint will be uploaded tomorrow



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5

Preparatory study according to MEErP

Tasks in MEErP (see website):

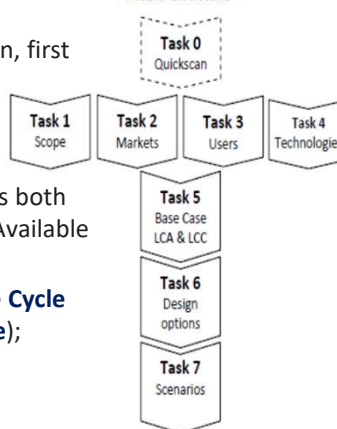
THIS MEETING:

- » **Task 1 - Scope** (definitions, standards and legislation, first screening);
- » **Task 2 – Markets modelling** (volumes and prices);
- » **Task 3 – Use modelling** (product demand side);
- » **Task 4 - Technologies** (product supply side, includes both **Best Available Technology(BAT)** and Best Not Yet Available Technology !BNAT);
- » **Task 5 – Environment & Economics (Base Case Life Cycle Analysis(LCA) & Life Cycle Costing(LCC) = reference);**

NEXT MEETING:

- » **Task 6 – Design options to improve** LCA + LCC;
- » **Task 7 – Scenarios** (Policy, scenario, impact and sensitivity analysis).

MEErP structure



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6

Task planning overview

Project Planning (Started in August 2019)																	
Months	2020																
	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Task 1 - Scope																	
Task 2 - Markets																	
Task 3 - Users																	
Task 4 - Technologies																	
Task 5 - Environment & Economics																	
Task 6 - Design Options																	
Task 7 - Scenarios																	
Meetings																	
Deliverables																	



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7

General approach Task 1-7

Based on exploratory study (Task 0):

- » **BACS-function oriented approach** with the **focus on the Technical Building System (TBS)** related functions **using the EN 15232 standard** as a starting point.
- » **In addition in limited extend** (= Task 1/3-4/7 only):
 - » **Self-consumption**
 - » requirements for **durability**, (today Task 6 = **life time**)
 - » **Interoperability** for Demand Side Management: **input with regards to definitions is welcome in writing** be aware that:
 - » technical solutions are still part of R&D projects (e.g. H2020 interconnect)
 - » **lack of EU27/country harmonized definitions and business cases for grid flexibility** <> principle of subsidiarity
 - » .. It **won't be evident to provide acceptable solution**, could require lengthy discussions <> time available in this study



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8

» Recommended to has for scope the EN 15232 function + includes the add-

General approach Task 1-7

- » Considered **the limited time available**, it was agreed with the EC that:
 - » **Narrow down the range of buildings, applications and climate zones.**
 - » 3 climate zones of MEErP (see Task 3)
 - » Small set of reference cases(see Task 3)
 - » **Model up to 16 cases by the consultants as input to Task 4-6**
 - » **Stakeholders can provide more case when the all data/modelling is provided and can be reviewed/verified by the consultants**
 - » Sensitivity on parameters(location, orientation, ..)can be done in Task 6

General approach Task 1-7

- » Based on the exploratory study: focus on BACS functions(EN 15232 based) for TBS to provide EE.
- » Website <https://ecodesignbacs.eu/>
- » An approach largely parallel to Lot 37, BUT:
 - » Lot 37 varied more in applications & less in technology<> Lot 38 more differentiation in functions and affected TBS.
 - » Lot 37 looked also a the impact of design (zoning, daylight, reflection, geometry). 'Lumen factor' but also had the 'control factor'.
 - » In comparison to Lot 37, we will also do Task 6 LLCC optimization to explore minimum requirements.

Task 1 Scope - definition

BACS and their functions are clearly defined in EN standards

- » **BACS(EN ISO 16484-2):** Building Automation and Control Systems comprising all products and engineering services for automatic controls (including interlocks), monitoring, optimization, for operation, human intervention and management to achieve energy-efficient, economical and safe operation of building services. Controls herein do also refer to processing of data and information”.
- » **BAC (EN 15232):** products, software, and engineering services for automatic controls, monitoring and optimization, human intervention, and management to achieve energy-efficient, economical, and safe operation of building services equipment
- » **BAC function (EN 15232):** the BAC effect of programs and parameters. BAC functions are referred to as control functions, I/O (input/output), processing, optimization, management and operator functions



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11

Task 1 Scope - definition

- » BACS energy performance classes of EN 15232, range from **D to A**
 - » **BAC function** have **several levels** of functionality, range **0 to 4**
- » ‘Other’ building automation functions not related TBS en EPBD ‘out of scope’ (e.g. intercom, fire alarm, etc..)
- » BAC hardware see report for definitions and Task 2

		Definition of classes				
		Non residential				
		D	C	B	A	
1.6	Heat generator control (combustion and district heating)					
	0 Constant temperature control					
	1 Variable temperature control depending on outdoor temperature					
	2 Variable temperature control depending on the load					
1.7	Heat generator control (heat pump, outdoor unit)					
	0 On/Off-control of heat generator					
	1 Multi-stage control of heat generator capacity depending on the load or demand (e.g. on/off of several compressors)					
	2 Variable control of heat generator capacity depending on the load or demand (e.g. hot gas bypass, inverter frequency control)					



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12

Task 1 Scope – definition (SC/interoperability)

input with regards to these definitions is welcome in writing

- » only consider the “**additional self-consumption of BACS** to operate more than a performance level 0 according to EN 15232”

≠ **stand by power consumption** which is considered a non issue as BACS are normally always working and have no stand by mode

- » **BACS interoperability definitions** are given for **DSM** (see study)

input with regards to definitions is welcome in writing (format look at Task 7 ED PV study)!

technical solutions are still part of R&D projects(e.g. H2020 interconnect)

lack of implemented EU27/country harmonized definitions and business cases

- » **BACS according to the market:** residential vs non residential, existing, renovated, LEB, NZEB)



Task 1 Scope – Functional Unit

- » What?

the **quantified performance of a product or system** for use as a reference unit in life cycle assessment studies (ISO 14040 on *life cycle assessment (LCA)*)

- » Why?

Will play an important role in Task 6 **to compare improvement options**.

- » Which one:

The primary function of a BACS is to control the Technical Buildings Systems (TBS) in order to maintain the indoor environmental requirements for: thermal comfort, sanitary hot water (SHW), indoor air quality (IAQ) and lighting according to EN ISO 17772-1:2017.

The primary functional unit (FU) is 1 m² of building floor area wherein those comfort requirements are maintained [1 m²].

Task 1 scope – other in a nutshell

- » Includes references to standards, gaps are related to interoperability for DSM (see previous)
- » Note:
 - » Strong link with the EPBD set of standards
 - » Link with Smart Readiness Indicator (provide information)
 - » Link/ potential overlap with many other Ecodesign product groups (updated on the next review)