Work package 3 - Analysis

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FCH Test Center

DTU Energy Conversion

Berlin, 20-21 February 2013

First Project Meeting

- Objectives
- Tasks and deliverable to December 2013
- Progress to February 2013
- Issues and corrective actions
- Time plan to end December 2013
- Upcoming important actions
- Q&A

Objectives

What can we learn from the field trials – in general and from each other?

Best practice. Exchange experience.

#	Work task	Objective of work task	Comments
3.1	Field support arrangements	Review previous project on vocational training. Define best practice.	In progress
3.2	Non-economic barrier analysis	Identify barriers to technology mass uptake incl. social and policy barriers.	In progress
3.3	Total cost of ownership	Economic comparison of FC-mCHP with other low carbon technologies.	Not started
3.4	Environmental life cycle assessment	Environmental impact of 2 types of FC-mCHPs analysed using a ”cradle to grave” approach.	Not started
3.5	Regulation, codes and standards	Establish a common voice on RCS addressed to standardisation bodies.	In progress
3.6	Utility working group	Identify technical ”smart grid” capabilities and future integration possibilities and barriers.	Just started

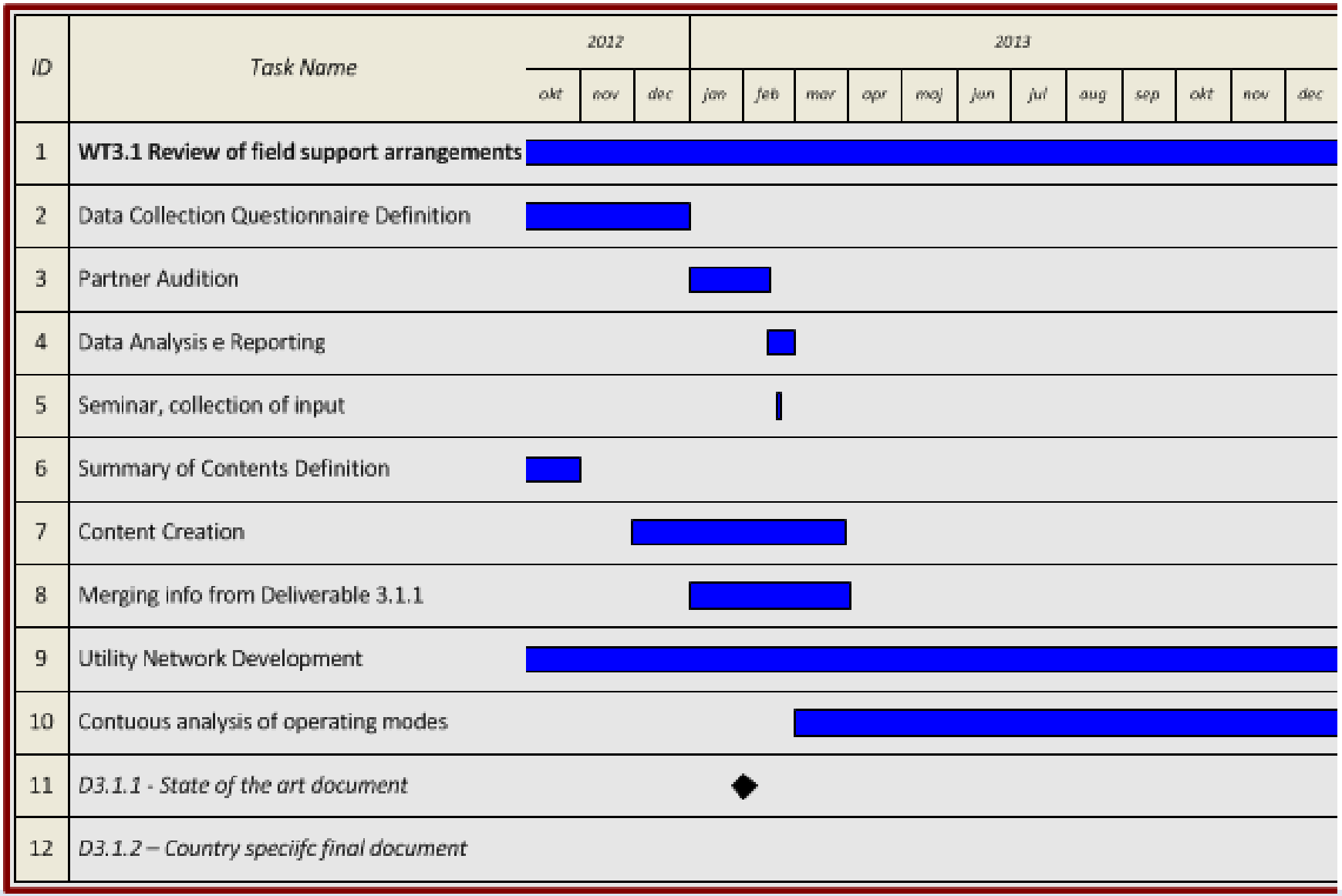
WT3.1 Field support arrangements

WT 3.1 Field support arrangements	
Task: Seminar reviewing current operating modes of participating manufacturers	Yesterday
Deliverable: A document evaluating ”the state of the art” and lessons learnt as from previous project.	Month 6

WT 3.1 Field support arrangements

- Summarising current knowledge from previous projects
- Individual discussions with each manufacturer
- Seminar on ”the state of the art” held yesterday

Timeplan to end December 2013



ID	Task Name	2012 okt	2012 nov	2012 dec	2013 jan	2013 feb	2013 mar	2013 apr	2013 maj	2013 jun	2013 jul	2013 aug	2013 sep	2013 okt	2013 nov	2013 dec
1	**WT3.1 Review of field support arrangements**															
2	Data Collection Questionnaire Definition															
3	Partner Audition															
4	Data Analysis e Reporting															
5	Seminar, collection of input															
6	Summary of Contents Definition															
7	Content Creation															
8	Merging info from Deliverable 3.1.1															
9	Utility Network Development															
10	Contuous analysis of operating modes															
11	*D3.1.1 - State of the art document*															
12	*D3.1.2 – Country speciifc final document*															

WT 3.1 Field support arrangements

- Report the first deliverable (3.1.1)
- How to proceed until next seminar (month 18)
- Collecting the interest to reach Italian utilities for the demonstration activity (in progress)

WT3.2 Non-economic barriers

Aims and objectives WP3 – Barrier Analysis

OBJECTIVE:

- **Collate and identify the key barriers** to mass uptake of the technology. Technical, political and consumer perception barriers.

OUTPUT INCLUDES:

- **Barriers encountered** in developing and fulfilling the demonstration projects.
- **Key enabling factors**
- **Performance barriers** - does the performance and reliability meet the needs of the consumer. Description of any gaps.

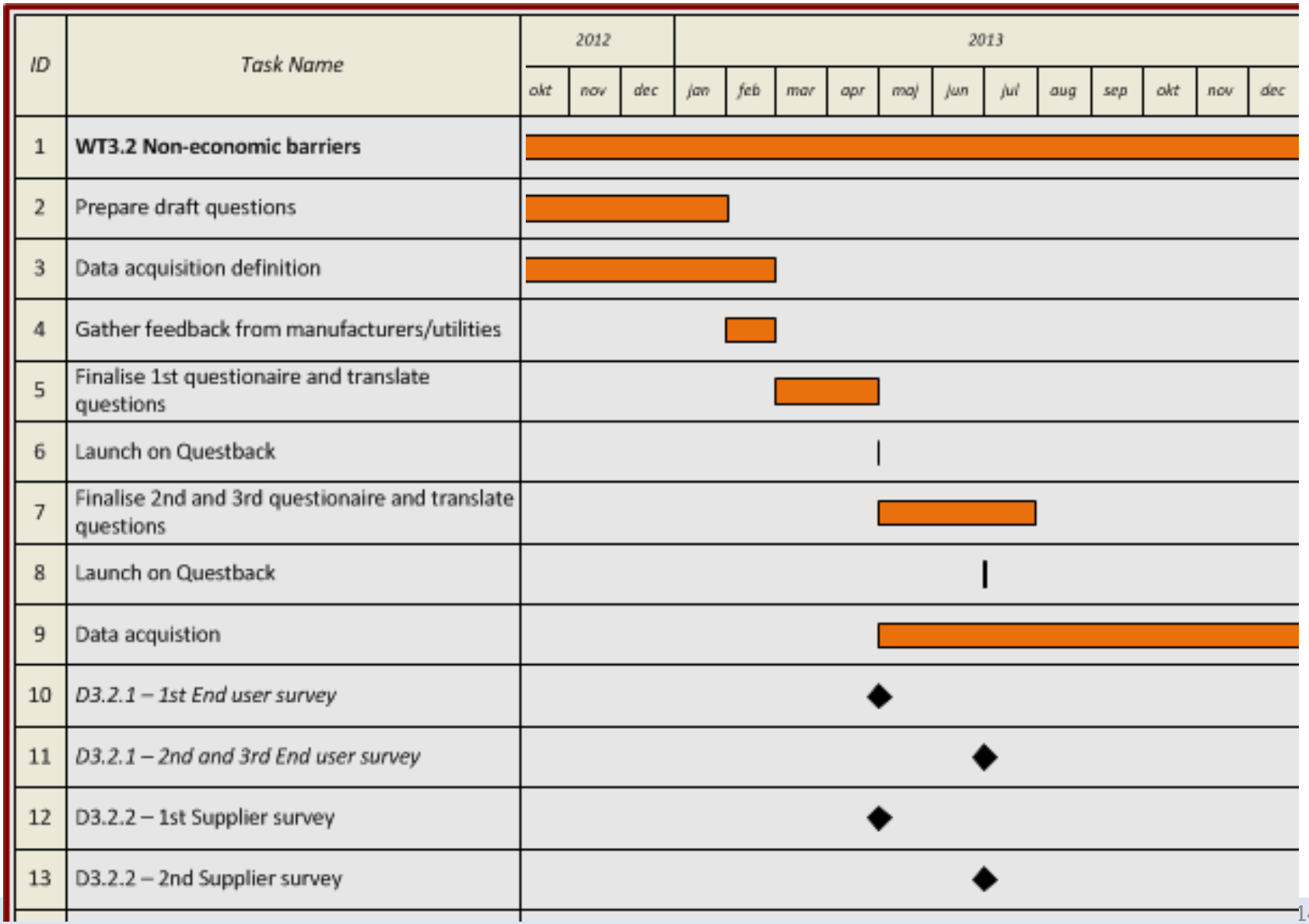
WT 3.2 Non-economic barrier analysis	
Task: Launch of end-user and manufacturer surveys.	Upon installations
Deliverable: End user survey on perception and expectation	Month 6→8
Deliverable: Manufacturer survey	Together with WP2

WT 3.2 Non-economic barrier analysis

- Communication with Callux and DK µCHP project on lessons learnt.
- Questions for surveys have been defined.
- The end-user survey is suggested to be split into three sections:
  1. Survey on demography and satisfaction with current energy solultions; upon installation
  2. Understanding and satisfaction; after ~1 year
  3. Behavioural change; after survey #2

- The first end-user survey will be finalised in March/April.
- Manufacturer/installer survey is coordinated with WP2.

Timeplan to end December 2013



ID	Task Name
1	**WT3.2 Non-economic barriers**
2	Prepare draft questions
3	Data acquisition definition
4	Gather feedback from manufacturers/utilities
5	Finalise 1st questionaire and translate questions
6	Launch on Questback
7	Finalise 2nd and 3rd questionaire and translate questions
8	Launch on Questback
9	Data acquistion
10	*D3.2.1 – 1st End user survey*
11	*D3.2.1 – 2nd and 3rd End user survey*
12	D3.2.2 – 1st Supplier survey
13	D3.2.2 – 2nd Supplier survey

WT 3.2 Non-economic barrier analysis

- Coordination and final development of surveys.

WT3.3 Total Cost of Ownership

This work task starts in month 30.

Progress: Specification of data requirements.

Aim:

- To assess **total cost of ownership** of mCHP systems across the range of member states involved in the trial (taking into account differing **house types, climatic zones and fuel prices**)

OUTPUT:

For representative house types:

- **Predicted total cost of ownership, highlighting optimum markets**

To make conclusions robust and valid requires:

- Real performance data of the mCHP systems in the field
- True demand profiles from the households, at sufficient resolution to recognise transient loads

WT3.4 Environmental life cycle assessment

Progress:
Specification of data requirements.

Discussion with manufacturers to make the LCA as useful as possible →
Suggestion for sensitivity analysis incl. factors such as climate region and household type.

Objectives and outputs WP3 – LCA

OBJECTIVE:

- Describing & comparing the environmental performance of decentralized small heat and power generation systems installed for different use cases & operated under different climatic conditions
- Comparison based on the total amount of heat and power demanded per use case (i.e., not only the energy provided by the fuel cells)
  - Note: *Comparison only possible if systems fulfill the same function (i.e., meeting the same demand)*

MAIN QUESTION TO BE ANSWERED:

- What is the environmental performance of mCHP fuel cells combined with back-up heating systems as a function of differing climate conditions, use patterns (defined by building type, load curve, etc.) as well as type of fuel cell and type of back-up heating system?
- Comparison of the environmental performance of systems in similar conditions

BENEFITS TO MANUFACTURERS:

- Environmental profile of their mCHP fuel cells with and without back-up system / peak load boilers

WT3.4 – Environmental life cycle assessment

- Contacting a SOFC manufacturer in order to optimise outcome of LCA.
- Finding consensus between manufacturers on the “default” FC systems and conventional systems to analyse.
- Coordination with Element Energy regarding consistency between the LCA and TCO analyses.

LCA

- ”This work task starts in month 30”. Not according to manmonth distribution and reality.
- Activity has started already.
- Time for deliverables and milestone remain.
- Budget remains.

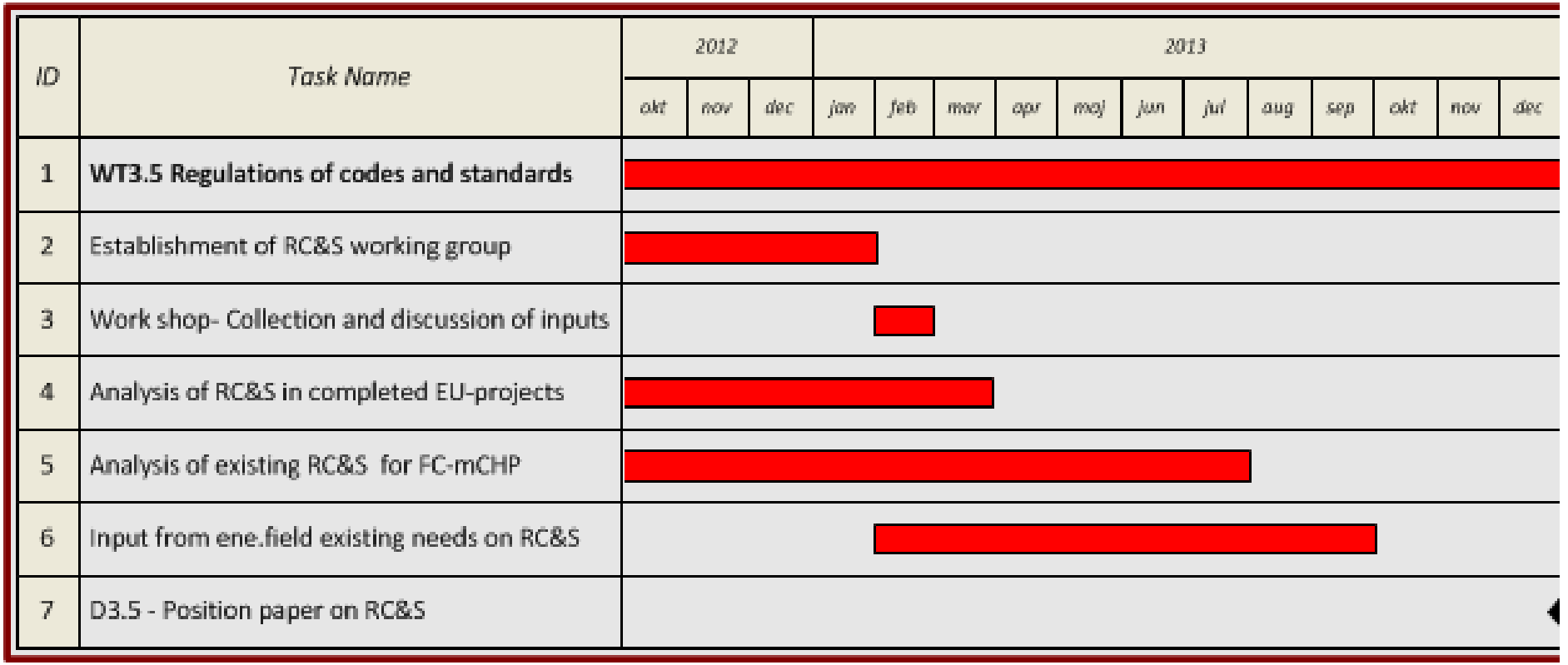
WT3.5 Regulations, Codes and Standards Working Group

WT 3.5 Regulation, codes and standards	
Task: Work shop presenting achieved results	Yesterday
Analyse RC&S of previous EU projects	2013
Analyse RC&S of FC-mCHP	2013
Assess additional needs for RC&S	2013
Deliverable: Position paper reporting a common voice on RCS on FC-mCHP	Month 15

WT 3.5 Regulations, codes and standards

- Remote meeting held on the 31st of January
- Collection of input from manufacturers
- Work shop on achieved results held yesterday

Timeplan to end December 2013



ID	Task Name	2012 okt	2012 nov	2012 dec	2013 jan	2013 feb	2013 mar	2013 apr	2013 maj	2013 jun	2013 jul	2013 aug	2013 sep	2013 okt	2013 nov	2013 dec
1	**WT3.5 Regulations of codes and standards**															
2	Establishment of RC&S working group															
3	Work shop- Collection and discussion of inputs															
4	Analysis of RC&S in completed EU-projects															
5	Analysis of existing RC&S for FC-mCHP															
6	Input from ene.field existing needs on RC&S															
7	D3.5 - Position paper on RC&S															

WT3.6 Utility working group

WT 3.6 Utility work group	
Task: Establishment of work group	
Task: Hold meetings discussing: 1. Exchange lessons learnt from trials 2. Assess grids connection issues 3. Review smart grid capacities	

Timeplan to end December 2013

ID	Task Name	2012			2013											
		okt	nov	dec	jan	feb	mar	apr	maj	jun	jul	aug	sep	okt	nov	dec
1	**WT3.6 Utility Working Group**															
2	Establishment of Utility Working group															
3	Input from manufacturers (cost, technology)															
4	Input from utilities (cost, smart grid tech etc)															
5	Biannual discussions															
6	*D3.6.1 – Position paper on grid connection*															
7	D3.6.2 – Position paper on grid connection															
8	*D3.7 – Summary report – route to market and existing barriers*															

WT3.6 – Utility working group

- Clarify future organisation of the work task.

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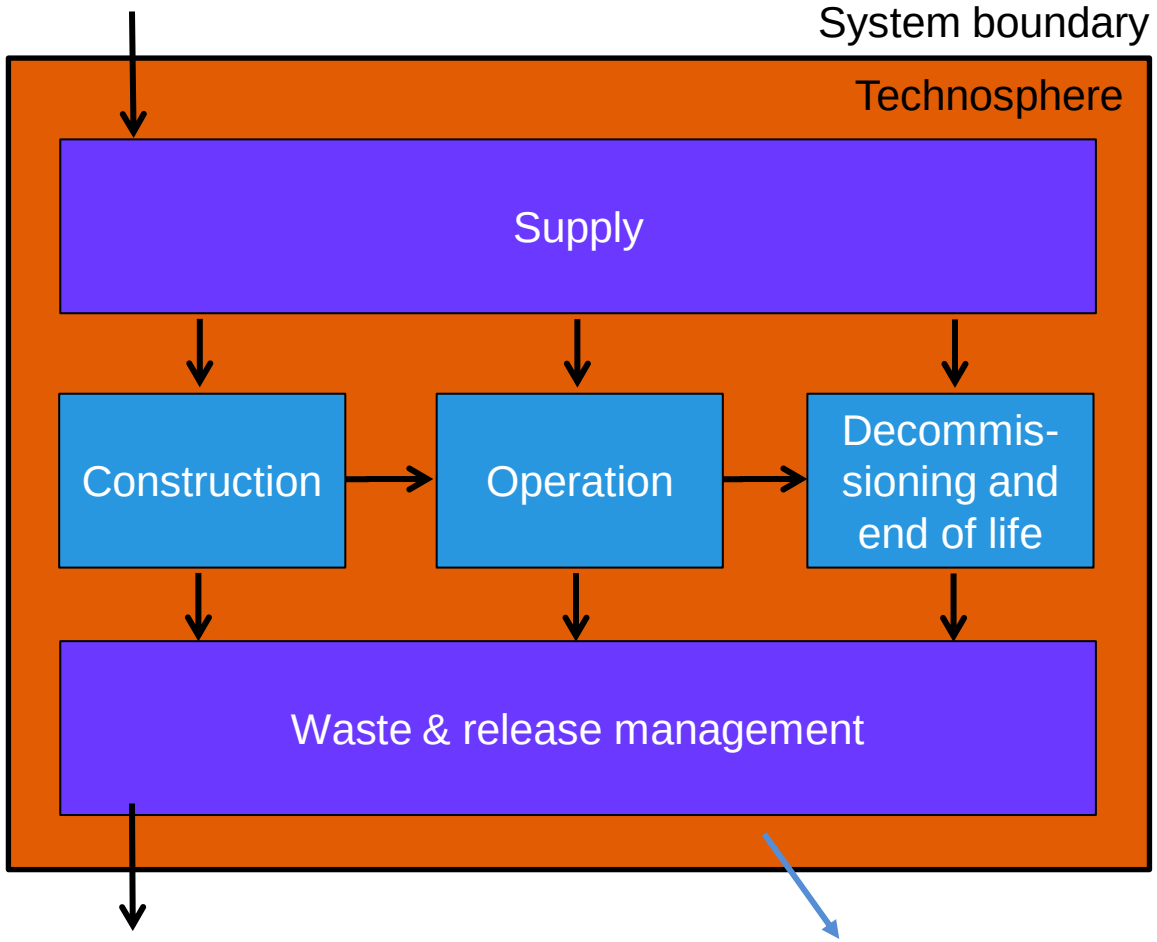
Please copy both of us in the communication. Thanks!

Further info on the LCA

Till Bachmann
EIFER

- Goal of environmental Life Cycle Assessment
  - Assessing a product's environmental performance
    - Resource use: metals, ceramics, land, water, fuels, etc.
    - Emissions to the environment (air, water, soil)
  - Comparing different systems of same functionality
    - SOFC µCHP, PEM µCHP, natural gas boiler + electricity from the grid, etc.
  - Identifying hotspots
    - E.g. fuel consumption, provision of steel
  - Comprehensive …

Input:
Resources (materials, energy, land, water)

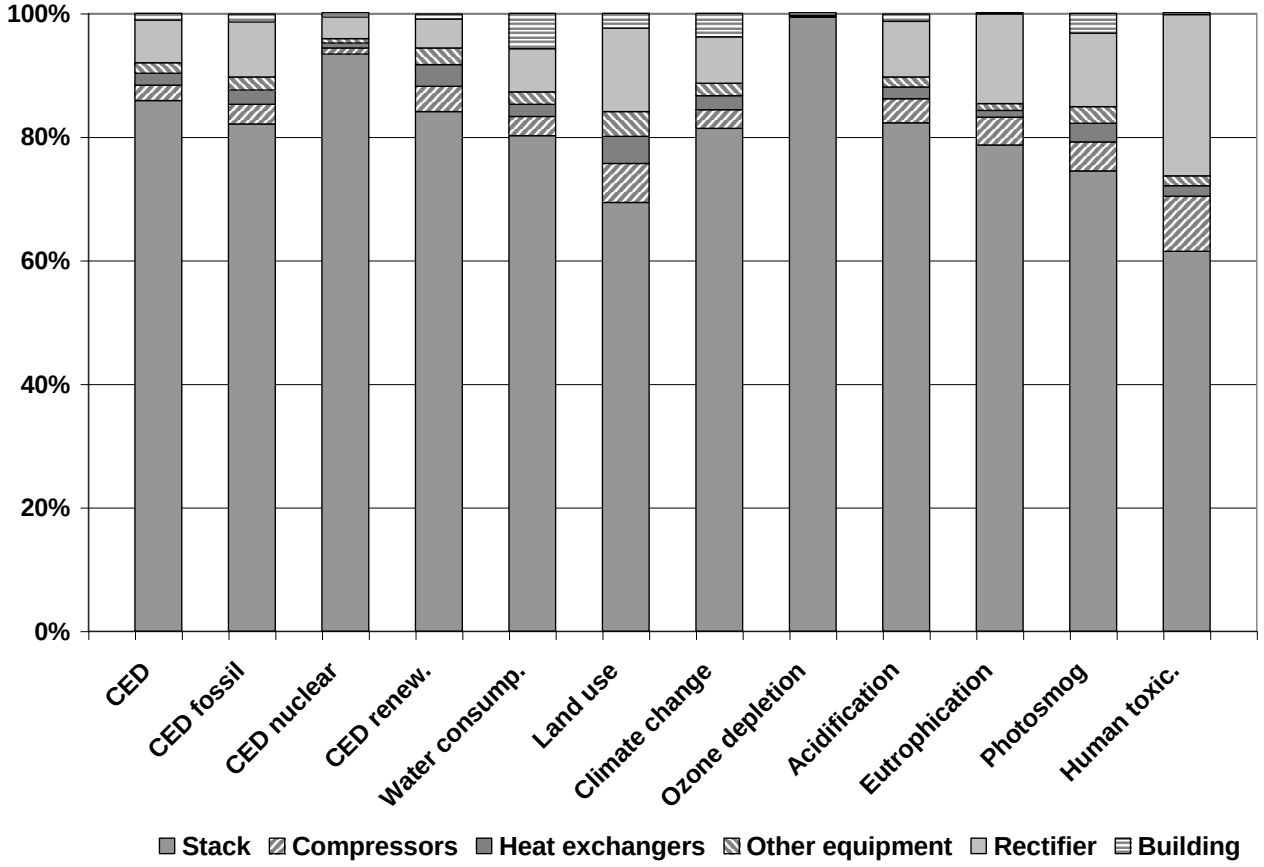


Output:
Releases to the environment

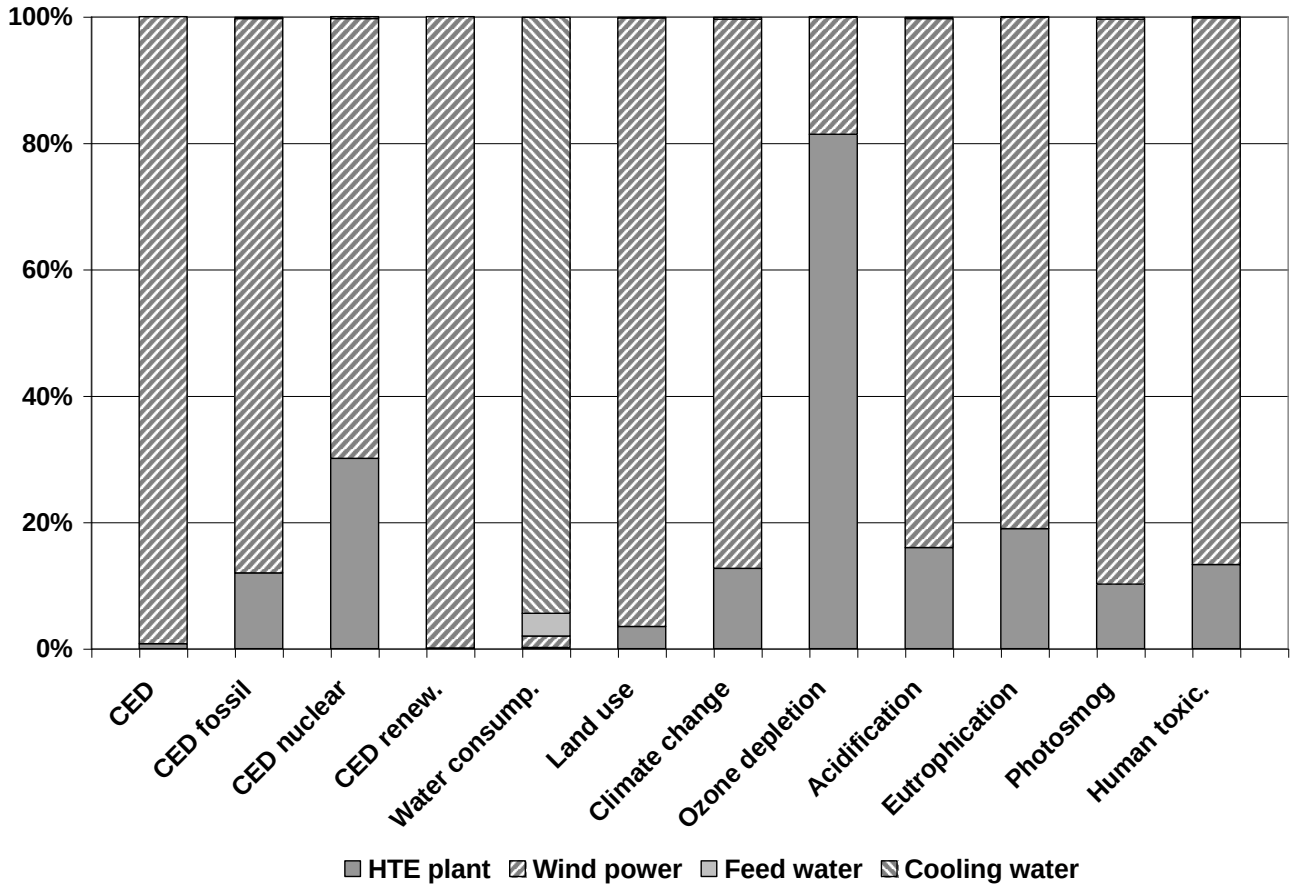
Function: E.g.
Electricity & heat production

- Identifying burden shifting
  - Across time / life cycle stages
    - E.g. light weight vehicles & energy: use → production
  - Across space
  - Between types of impacts
    - E.g. natural gas to wood-based conventional heating: climate change (CO_2) → health (particles)
- LCA will try to highlight the environmental advantage of FC-based µCHP over conventional systems
  - Looking also beyond use phase & CO_2-eq.

- SOEC – Wind Power + Steam: plant construction



- SOEC – Wind Power + Steam: H_2 production & supply



- Comparison of different H_2 production & supply systems