

1. Costs and Benefits of Renewable Energy to Society

2. Scope of work

2.1 Objective

This activity will primarily contribute to Objective 3 of the IEA RETD: "Information and dissemination". In addition the activity contributes to Objective 1 of the IEA RETD "Elaborating and present options for "best practise" policy measures.

2.2 Purpose

It is often highlighted that the benefits of renewable energy and the disadvantages of conventional technologies are not sufficiently accounted for in energy markets and in energy planning and policy making. Consequently there is a need for a level playing field for RE technologies and conventional fossil and nuclear technologies. Many of the benefits of renewables are omitted when investors take decisions on commissioning new energy plants as these can be difficult to monetarise whilst external costs from conventional energy production are often excluded, which further discriminates against renewable energy.

Subsidies provided for conventional energy production, such as for domestic coal, distort the playing field for renewable energy technologies and in turn make renewables comparatively more expensive.

The so-called *learning curve effect* – the fact that increased deployment of renewable energy decreases generation costs over time – is often ignored or underestimated, which further hinders the deployment of renewables.

The objective of this project is twofold, firstly to **estimate the costs and benefits of renewable energy** compared to traditional energy sources, and secondly to identify **improvement possibilities** for renewable energy technologies/sources through the learning processes.

The project should provide the basis for developing recommendations for international policies that will contribute to levelling the playing field for renewable energy.

2.3 Stakeholders and target group(s)

The activity is targeted at policy makers in charge of shaping energy markets and policies for the promotion of RE in general, including policy analysts within the IEA. The international policy level makes up a particular target group, because security of supply, technological development (the learning curve effect) and the question of environmental externalities are all issues where international solutions are needed.

Student and scholars make up a secondary target group. For instance the proposed web tool/interface (see below) could be used for educational purposes.

2.4 Main activities

A) Preparation of a template for comparing energy supply costs

- a. Definition of supply categories:
- b. Definition of technologies
- c. Definition of cost elements

This includes the following elements

- Basic long run marginal costs (investment, fuel, O&M).
- System integration
- Conventional energy subsidies
- Environmental externalities on a life cycle basis
- Security of fuel supply

- Local benefits (employment)

Comparisons will be made on a money/output basis, e.g. €/MWh (see figure 1 below) to illustrate the Levelized Unit Energy Cost on a life cycle basis.

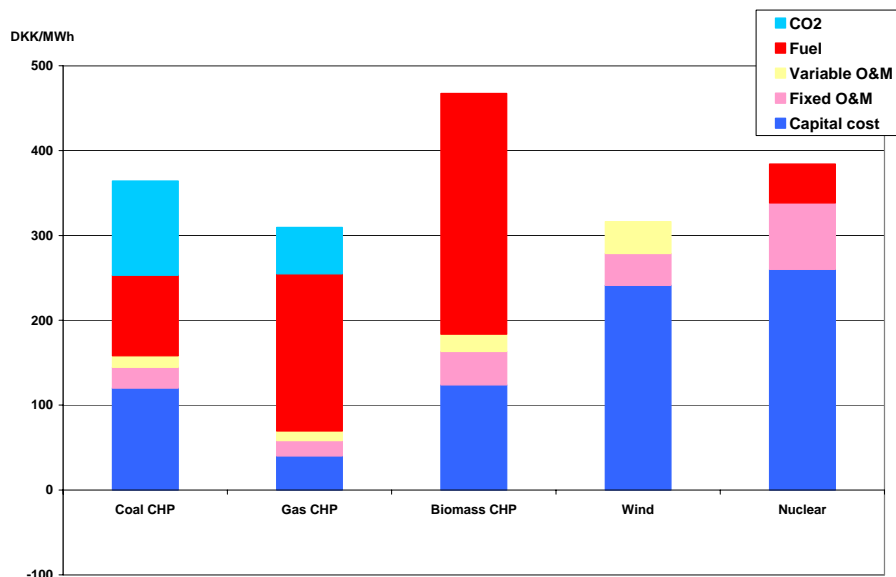


Figure 1: Example of 'technology cost comparison'

B) Literature survey.

Technology specific data will primarily be based on relevant IEA reports and data from RET-screen and CERI (Canadian Energy Research Institute). The assessment of environmental externalities will primarily rely on the documentation provided in the EU research project ExternE. It is not the intention to undertake new research within this project but rather to rely on existing studies. Data on system integration will be obtained from Transmission Operators, e.g. through the German DENA study and similar Danish reports. The ExternE has also made preliminary attempts to value benefits of security of supply. Literature on policy initiatives and instruments that distort renewable energy markets will be reviewed and the impacts will be assessed. In addition suggestions on ways to eliminate distortions will be provided. Focus on this part will be on a limited number of countries including Canada, Germany and the UK.

C) Consultation.

A consultation process of the draft report should be carried out with the IEA, relevant IEA implementing agreements and utilities/TSOs, national authorities and relevant research institutes.

- Comments should be received on the methodology and on key assumptions
- Comments should primarily be obtained by email – alternatively “web-consultation”. Interviews/mini workshops could be arranged with key stakeholders

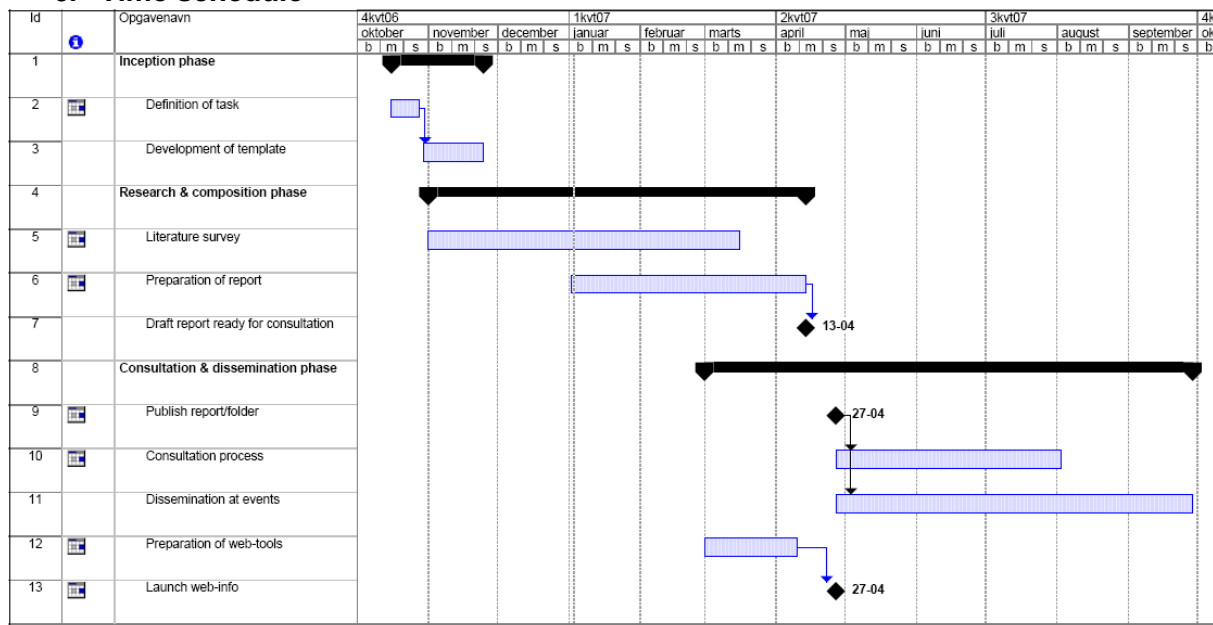
D) Reporting and dissemination.

- A report summarising the findings of the activity
- A popular folder
- A website interface/portal at www.iea-retd.org. The website should be interactive allowing the user to adjust key parameters for the comparison of different technologies such as fuel prices, interest rate, RE resource potentials etc. The level of transparency must be high, for

example by making all technology assumptions available at the site. It should be possible to calculate costs of different technologies with and without the costs of CO2.

- A web-cast (video presentation of the project results addressing the general need for a level playing field for renewables)

3. Time schedule



4. Budget

Task	Man days @ €805	Man days @ €502	Ext. Consultant	Other cost	Sum
Task definition/template	2	2			2.614
Survey - technology	2	10	5.000		11.630
Survey - Security of supply	2	10	5.000		11.630
Survey - environmental	3	10			7.435
Survey - integration	3	10			7.435
Survey - legislation	5	10	10.000		19.045
Design - web interface	3	5	20.000		24.925
Report and webinfo	10	10			13.070
Consultation of report	10	5			10.560
Meetings and travel	3	3		6.000	9.921
Total	43	75	40.000	6.000	118.265