



SYNOPSIS OF CASES

Project information

Project acronym: CASES

Project full title: Cost Assessment for Sustainable Energy Systems

Funded by: European Commission, FP6, Sustainable Energy Systems, 2006-2008

Duration: 30 months

Start date of the project: 1st April 2006

List of partners:

- 1) Fondazione Eni Enrico Mattei (FEEM)
- 2) University of Bath (UBATH)
- 3) National Technical University of Athens (NTUA)
- 4) University of Stuttgart – Institute of Energy Economics and the Rational Use of Energy (USTUTT/IER)
- 5) Flemish Institute for Technological Research (VITO)
- 6) Risoe National Laboratory (RISOE)
- 7) Observatoire Méditerranéen de l'Energie (OME)
- 8) University of Flensburg (UFLENS)
- 9) Energy Research Centre of the Netherlands (ECN)
- 10) Vrije Universiteit Amsterdam-Institute for Environmental Studies (VU/IVM)
- 11) ECON Analysis AS (ECON)
- 12) Fundação COPPETEC (COPPETEC)
- 13) SWECO Grøner as (SWECO)
- 14) Lithuanian Energy Institute (LEI)
- 15) Indian Institute of Management Ahmedabad (IIMA)
- 16) Energy Research Institute (ERI)
- 17) Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT)
- 18) Univerzita Karlova v Praze - Charles University Environment Center (CUEC)
- 19) Stockholm Environment Institute (SEI)
- 20) Centre for European Policy Studies (CEPS)
- 21) University of Warsaw - Warsaw Ecological Economic Center (UWARS)
- 22) Energy Agency of Plovdiv (EAP)
- 23) Turkiye Bilimsel ve Teknik Arastirma Kurumu - Marmara Research Center, Institute of Energy (TUBITAK)
- 24) Wageningen Universiteit (WU)
- 25) Istituto di Studi per l'Integrazione dei Sistemi (ISIS)
- 26) Paul Scherrer Institut (PSI)

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Objectives

The CASES project aims:

- (1) To compile coherent and detailed estimates of both external and internal costs of energy production for different energy sources at the national level for the EU-25 Countries and for some non-EU Countries under energy scenarios to 2030. Hence, the integration of private and external costs is build within one dynamic framework, to arrive at agreed ranges of estimates for



different countries of the full cost of each energy source, which includes the external cost plus the private cost.

- (2) To evaluate policy options for improving the efficiency of energy use, taking account of full cost data. This part of the project will focus on the impact of a given policy measure on the environment and on the use of different types of energy. Moreover, the social and fiscal implications of a given policy measure, especially on poor and vulnerable groups, will be assessed.
- (3) To disseminate research findings to energy sector producers and users and to the policy making community, through events that serve to validate and disseminate the projects outputs and to present the results.

Challenges

This project intends to derive a consistent and comprehensive picture of the full cost of energy, and to make this crucial knowledge available to all stakeholders.

A complete and consistent assessment of the full cost of energy sources, which includes the external cost plus the private cost, is of paramount importance for energy and environmental policy making. Energy policy making is concerned with both the supply side and the demand side of energy provision. On the energy supply side deciding on alternative investment options requires the knowledge of the full cost of each energy option under scrutiny. On the demand side, social welfare maximisation should lead to the formulation of energy policies that steer consumers' behaviour in a way that will result in the minimisation of costs imposed to society as a whole. Demand side policies can benefit significantly from the incorporation of full energy costs in the corresponding policy formulation process.

The geographical dimension is also important since environmental damage from energy production crosses national borders. Moreover the EU enlargement process associated to the liberalisation of energy markets have highlighted the importance of a systematic harmonisation process, in which cost formation mechanisms and price setting must become transparent and reflect the total, real costs of energy provision across the continent and beyond. In turn, this requires the adoption of a common set of methods and values. Hence a consistent set of energy costs allows a better understanding of the international dimensions of policy decisions in these areas. Naturally, differences in estimates exist between countries, sources of energy, and technology used in the generation of the energy. But the present state of knowledge is disparate and some gains can be made by clarifying when and where particular estimates can be applied.

Moreover, costs are dynamic. The private costs and the external costs are changing with time, as technologies develop, knowledge about impacts of energy use on the environment increases and individual preferences for certain environmental and other values change.

Perhaps, the least well and least systematically covered area of external cost is that related to energy security. Even within one country estimates of the energy security costs of different types of energy remain somewhat elusive. A common methodology has not been applied to derive estimates for a range of countries. Yet, this is a major area of policy debate and key decisions are being taken to increase energy security and reduce dependence on foreign sources. Therefore, without undertaking primary research in terms of data collection, the project devotes significant resources in applying existing models across a range of countries to arrive at a common set of estimates of the costs of energy insecurity, as defined by a common set of parameters.



Project structure

This project builds on the formidable amount of research that has been done on measuring the full costs of the use of different energy sources such as fossil fuels, nuclear energy and renewable energy sources.

The internal costs, the private costs and the full cost are calculated and analysed through 7 inter-linked work packages that evaluate, compare and harmonise the system costs associated with alternative energy technologies covering exhaustively the whole range of relevant production, social and environmental costs involved.

The project focuses on Cost-Benefit and Multi-Criteria Decision Analysis, and makes a set of projections of energy demand by energy source and country. To this aim, it uses existing models for estimating such demand and adapts them so they are responsive to different projections about prices that suppliers receive and prices that users pay. These are critical to the policy analysis, which is investigated through 4 work packages that evaluate the effectiveness of alternative policy instruments to internalise social and environmental external costs, and the degree of integration of these costs into policy and investment decision-making. For this activity to be of practical benefit, the assessment is carried out with energy suppliers as part of the team, so that real world problems of applying the different instruments are reflected in the evaluation. This means that the hidden costs of implementation of policy, the adoption of new rules and regulations by the different actors, is reflected in the analysis.

More in detail, the policy assessment will go through the following steps. The comparative cost data are used to address a set of clearly defined goals for the policy analysis. In the political analysis is investigated the comparative assessment of investment and operational costs of different energy options taking account of only private costs and taking account of private plus external costs. This assessment is dynamic and will provide the implications of different levels of internalisation on the investment decisions and on key social indicators. Moreover the political analysis includes the impact of the use of different methods of decision-making on the selection of projects, the implications of different policies to reduce energy insecurity, now and over time and the implications of different taxes/charges on energy and/or on emissions on the degree of internalisation and the comparative cost comparisons, now and in the future. Different instruments to promote renewable energy sources are then compared in terms of the degree to which they internalise the positive externalities associated with renewable energy use and the use of externality based taxes for internalising externalities is compared to the effectiveness of emissions trading instruments.

The third part of the project is devoted to dissemination. Once it has been evaluated and brought into a coherent framework, the results of the different components of the project are of great interest to the energy sector producers and users, as well as the policy-making community. Dissemination consists of a set of activities to validate and disseminate the projects outputs. These activities are ranging from publication of articles in the peer reviewed literature, project workshops and conferences involving key stakeholders and policy makers, seminars and presentation of key results at additional meetings, presentations and open discussions with energy producers and user organisations and the setting up of a dedicated web site for CASES. (See Diagram annexed)

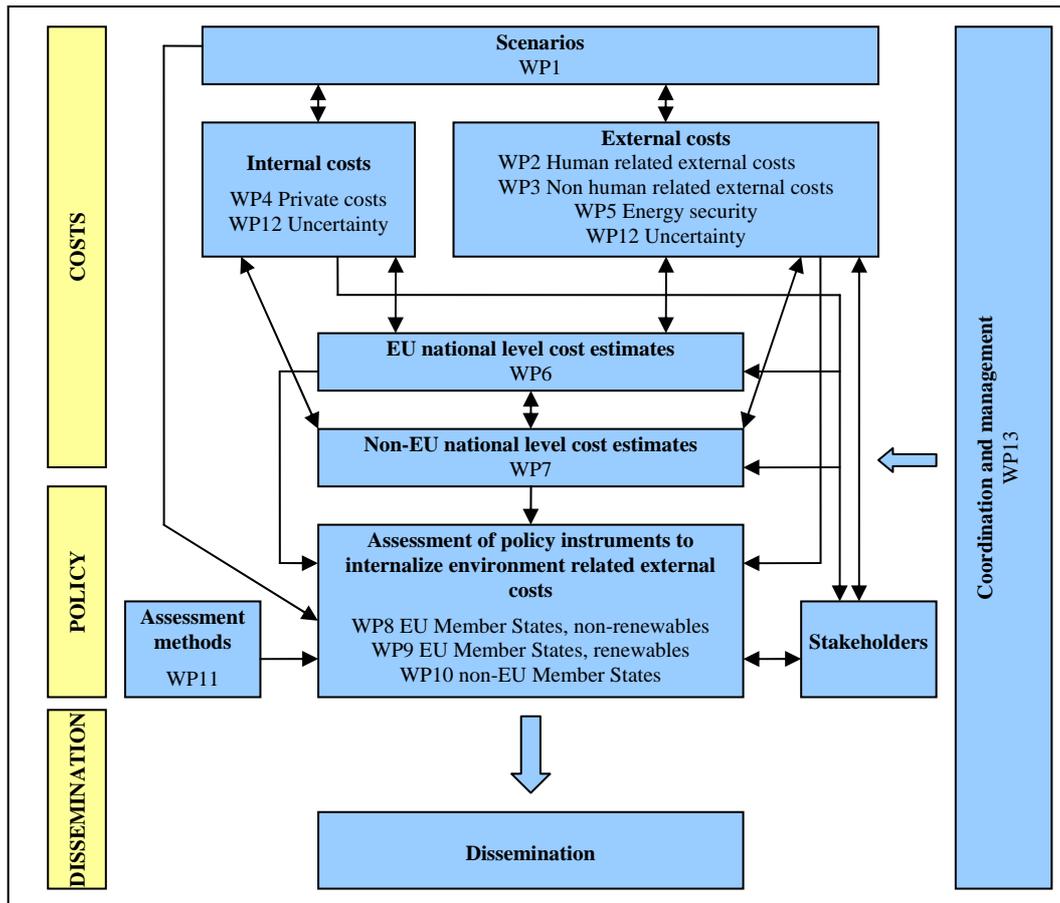


Figure 1: Diagram of the CASES work packages

Expected results

The expected results concern the best predictions about the evolution of the private and external costs - including energy security cost - of major technologies for generating energy, from different sources, in different countries, over the next 25 years.

CASES puts particular effort on the integration of private and external costs within one dynamic framework, as well as on the estimation of the state of knowledge and the gaps that remain in costs' estimation, through a full assessment across EU and non-EU countries. The project intends to ensure that the adoption of externality valuation methods is systematically extended to newly associated and EU candidate countries as well as to other countries beyond the current EU, and that the availability and quality of datasets are brought as close to par as possible. This approach therefore ensures that different local conditions are accounted for.

A comparative cost analysis, which includes social and environmental factors, is developed for present and future energy generation alternatives. Under this perspective a set of clearly defined policy objectives is addressed using the cost data. Policy issues are explored in a dynamic context to provide a comparative assessment of the policy analysis across different countries. In addition the project intends to look at how much of the external costs each policy option internalizes, using a broad set of variables of interest.

The project underlines also the greatest uncertainties and it indicates where future research effort should be concentrated.

Finally the success of the project is assessed in terms of the acceptability of the estimated energy costs by the scientific and policy communities and by the use made of these costs in a policy context.