ENDORSE PUBLISHABLE SUMMARY

The exploitation of renewable energies is one of the identified routes to move away from fossil-based fuels and decrease the detrimental impacts of the production and use of energy on our environment and societies. The potential of the Sun, rivers, the sea or wind, geothermal and biomass energy are presently being exploited in small shares in the European Union. Increasing those shares through more profitable commercialization of these resources will ultimately lead to better environmental management and will contribute to economic growth.

However, as renewable energies can, by their very nature, be rather prone to climatic conditions and often organized in distributed generation units, their effective exploitation requires careful analysis. The evaluation of resources for investment planning as well as the monitoring of energy production management may significantly reduce the cost of planning and deploying renewable energy systems and can be paramount for the integration of the variable energy sources into the main energy system.

Recent surveys and outcomes of projects funded by the European Commission or the European Space Agency, among others, have shown that there is a need for services, tailored to the specific needs in renewable energies, able to respond reliably and affordably to the expanding needs of end-users such as expert companies, industrial users (engineering bureaus, energy producers, investors, plant managers etc.), public authorities and other organizations including European policy makers.

The ENDORSE project (http://www.endorse-fp7.eu) covers all of the above (analysis, evaluation, assessment) and aims at developing new, and enhancing existing user-driven downstream services. By reducing the risks involved in the investment on renewable energy systems it promotes their exploitation for a better future in respect to both the environment and our well-being.

It is presently known that renewable energies (RE) can benefit significantly from Earth Observation (EO) data. Therefore, ENDORSE not only makes use of GMES Core Services and other EO/in situ data and modeling but is also taking them a step further by developing new leading services that provide energy components for GMES and GEOSS and by exploiting the most advanced and accurate EO data. In this way, it permits and promotes further innovation as well as advances in the modeling of the geophysical fields. ENDORSE puts emphasis on extending the development of information technologies in, for example, geography and interoperability, used as tools for more accurate evaluations of resources which are greatly needed for predicting the outcome of investments so as to facilitate the expansion of shares towards the finance of installations.

ENDORSE has identified ten services following the requests of local users – both public and private –focusing on solar, wind and biomass energy, electricity management and daylighting in buildings. These services have a market potential belonging to what is called ‘pre-market services’. These services show to the wider community the potential benefits to their daily work and decision making processes. ENDORSE offers services to different market sectors of renewable energies which are distinguished by the technologies used that define different active market players. As the consortium focuses on local downstream services, these market players are typically small or medium-size companies active in their respective geographically limited markets. Therefore, the consortium will develop the service in close cooperation with a dedicated prime user representative of a large number of users in other European regions. Once there is a concrete service example, this

information will be disseminated via workshops, trade fairs, conferences, publications, etc., to other potential service users/service operators for raising the number of service providers and the service coverage for more regions/users.

ENDORSE has established an efficient workflow for the best achievement of the project. The requirements of a limited number of well-defined users (WP2) will drive the development of the products (WP4) resulting from the research activity (WP3). As well, these requirements will contribute to the key elements for the design of the pre-market services (WP6). The interactions with an extended panel of users (WP5) will enable a refinement in the services development. Thematic workshops will demonstrate products and services to users and service industry and feedback on them will be collected (WP7). This feedback will feed the assessment of the sustainability of pre-market services (WP8). The management of ENDORSE (WP1) as well as the activities of dissemination of the scientific results (WP9) will be carried on during the three years of the project.

The first period (year 2011) has focused on the effectiveness of the management, specification of products by users, advances in environmental modeling needed for products, delivery of a first version of products, and creating awareness on the project.

A good spirit of cooperation has been installed within the Consortium. There is a common commitment towards the achievement of the objectives of ENDORSE. Progress meetings and other means of communications help in exchanges of information, best practices and expertise. Actions are proposed and decided during progress meetings and WP leaders play a very effective role.

Several communications tools have been set up to ensure an efficient management of the project. They include progress meetings, general assemblies, the Web site (both public and private parts), the monitoring of the progress of the work, deadlines for deliverables submission and milestones, and decisions.

An efficient interaction has taken place between the providers of products and the corresponding users. These users were identified prior to the beginning of the project. In two cases, these users have withdrawn and were replaced. Users requirements were collected thus permitting the start of the development of products. The requirements were collected in a homogeneous manner, so that they can be compared and possible synergies may be identified. For example, a same source of data may serve several products. It will also facilitate the development of operational services based on these prototypes. In addition to technical specifications, the collection activity put efforts on the definition of protocols and measures for the assessment of the acceptance of the products by users. Finally, for each product, a plan for scientific validation has been elaborated and documented.

Research activities brought solutions supporting development and improvement of products. A new method allows a fast and accurate computation of the course of the Sun in the sky. Based on existing recommendations from the World Meteorological Organization and articles, a series of automatic procedures has been developed to assess the plausibility of meteorological measurements made at ground level by ground stations. Under concern, are irradiation, air temperature, relative humidity, and wind. Automatic procedures have been adapted from the International Energy Agency (SHC-36) to benchmark products from GMES Core Services or ENDORSE products against meteorological measurements considered as reference for validation. A new method has been developed for producing local maps of air temperature at surface at fine scale. Inputs are infrared images from satellites. This method produces also a map of the uncertainty associated to air temperature.

First versions of the ten products are being developed and validated on scientific grounds. They will be presented in January 2012 to the associated users and assessed by them. Feedback will serve to improving the products.

The ENDORSE Web site aims at increasing the awareness of possible end-users and stakeholders and at disseminating the results of the project to a broad audience. ENDORSE has been presented to the GEO Secretariat and in various conferences and fora, such as the FP7-Space Conference or preparatory workshop for GMES Users Forum. Promotional material has been prepared for these presentations. Scientific articles are being prepared for disseminating advances in environmental modeling and will be submitted to international journals.

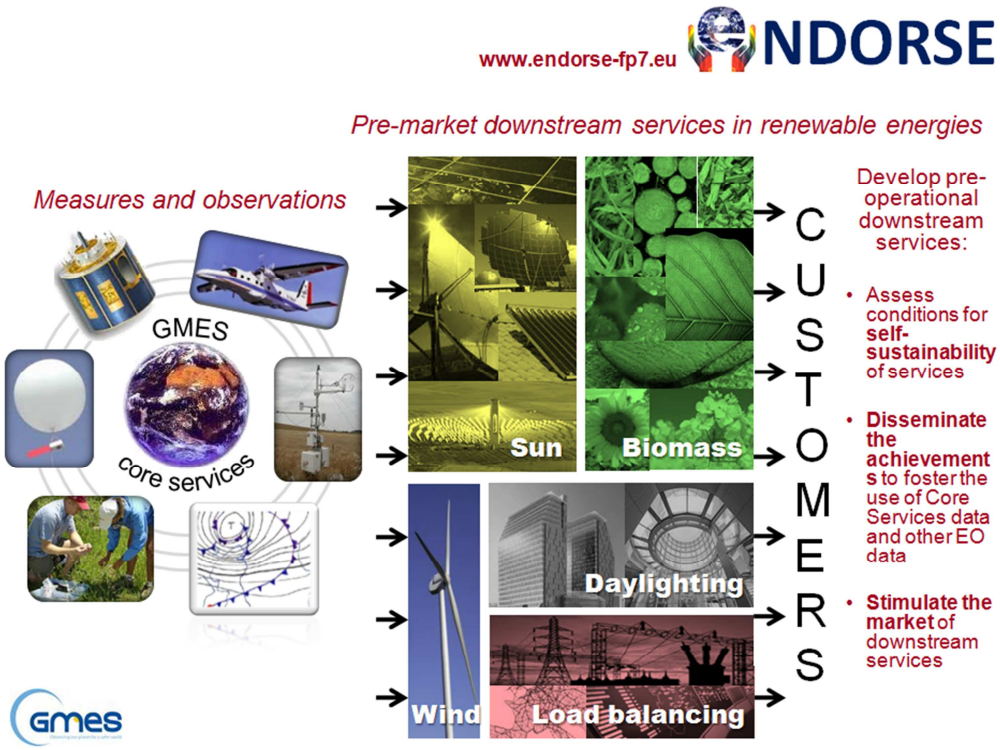

Figure illustrating the objectives and work to be done in the ENDORSE project, from the Web site www.endorse-fp7.eu.

New tools are available for a fast and accurate modeling of the geometry of the Earth relative to the sun, checking the quality of meteorological measurements, assessing the figures of merit of satellite-derived assessments of solar radiation, or estimating the air temperature at 2-m height. These tools are available as pieces of software or as web services. Their users are the scientific community at large and engineers in renewable energies as well as students at MSc level.

ENDORSE will produce a set of validated and documented innovative methods exploiting Earth Observation data together with a *portfolio* of pre-market services exploiting these methods with documented conditions of sustainability. These services will serve as precursors and examples of best practices for similar services (other regions, other providers).

By setting up and operating these services, ENDORSE will provide feedback to GMES services on the use and benefit of their data, and as a whole to GMES and GEOSS on the exploitation of Earth Observation data.

Subject these pre-market services are converted into operational services, they will serve users as identified in the course of the project. These users are policy makers, public agencies in

charge of energy, operators of electricity grids, operators of energy plants, consultants, investors, and architects.

Demonstrating these pre-market services and showing the benefits they can bring to the aforementioned users will stimulate their use in the renewable energies sector and more generally will increase the awareness of this sector about Earth Observation data and their potentials.

The availability of the demonstrators and their conditions of sustainability together with the evidence of interest from the users community will incite the service industry to develop similar services exploiting GMES services and other Earth Observation data.

List of partners:

ARMINES
DLR - Deutsches Zentrum fuer Luft- und Raumfahrt
iCons
Transvalor Innovation
Flyby
Hochschule Ulm
University of Genova
Ecole Nationale des Travaux Publics de l'Etat
3E
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