



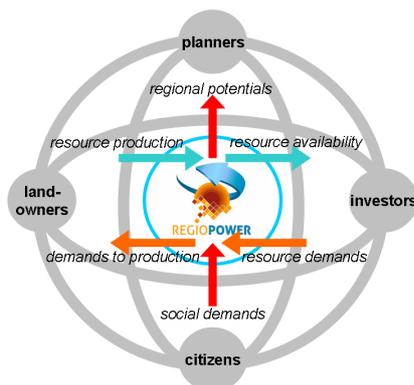
REGIOPOWER

A regional IT-based platform for bringing resource needs and land-based resource production together

Information sheet

RegioPower

is an **interdisciplinary project**, which focuses on the WoodWisdom / BioEnergy call text topic “**Forest for multiple needs of society, including enhanced productivity and optimised use of forest feedstock**” and within this topic on (e) “Handling conflicting interests of land-use incl. increased feedstock production for bioenergy and forest industry vs. other needs of society” under consideration of aspects touched by focus area (c) “Innovative concepts, processes and products for the commercialisation of forest ecosystem services, soft values and non-wood forest goods (including consumer expectations)” and (b) “Innovative concepts and processes for multiple use of forest land and forest-based feedstocks (e.g. wood for energy, building, furniture, pulp and paper, chemistry) and/or increased revenue to forest land owners”.



Overall objective

of RegioPower is to develop the **prototype of an innovative software platform for moderating between lignocellulosic resources demands from industry** (timber for wood-products & bio-energy, other bio-energy crops from agriculture), **land-based production of lignocellulosic resources and public demands considering the provision of ecosystem services** by regional land-use and land-management. The term “ecosystem services” is used as defined by the Millenium Ecosystem Assessment. Within RegioPower, a set of ecosystem services will be defined, which represents best the socio-economic and ecological

questions raised in the model regions. **Reference scale** for the software platform is the **regional scale**, where region is a **spatially definable unit with a functioning socio-economical and ecological network**. The project will be carried out in a **set of 5 model regions** in the partner countries (gradient Western, South-Eastern, Northern Europe) to ensure its transferability to differing environmental and socio-economical situations.

In detail RegioPower intends to

- a develop and provide an instrument for moderating between interests** of land-owners (resource production), investors (industrial demands), regional planners and citizens (regional economic development, provision of ecosystem services, other issues such as environmental protection).
- b support an optimized regional resource allocation** including resource distribution (who needs / provides resources) and logistic aspects (how to get resources from the producer to the consumer)
- c generate and provide knowledge** for an optimised land-use to make improved use of complementary regional potentials for the provision of lignocellulosic resources from forestry and agriculture. This includes also knowledge on the robustness of land-based resource and ecosystem services provision under Climate Change (CC) and the potential to contribute to the mitigation of CC driven risks.

Scientific and technological objectives

of RegioPower are

- A.** development of a **web-based regional feed-stock market for lignocellulosic resources** to moderate between land-based production and industrial lignocellulosic resource demands. This includes
 - a** the adaptation of the planning support tool PYL (Pimp your landscape) for simulating the impact of alternative land-management scenarios in forestry and agriculture on (i) regional production potentials for lignocellulosic resources and (ii) the provision of ecosystem services on regional scale;
 - b** the development of a software solution for (i) bundling, handling and coordinating lignocellulosic resource demands from industry and supply from land-based production and (ii) for optimizing related resource-distribution and logistic processes;
 - c** the integration of both software tools in a web-based regional feed-stock market platform.
- B.** **Modelling and evaluating** lignocellulosic resource production and its trade-offs for ecosystem services and other regional benefits (economic aspects). This includes
 - a** the adaptation of forest and agricultural growth and yield models to be embedded in PYL;
 - b** the development and adaptation of integrated evaluation approaches to assess the ecosystem services related trade-offs of alternative regional land-use scenarios;
- C.** **Integration of participatory processes based on advanced IT approaches with** regionally relevant stakeholders in the formulation of alternative regional land-use scenarios related to actual and future needs in lignocellulosic resources and ecosystem services. This includes the use of PYL and other visualization tools to assess preference in land-use and -management and in regionally important ecosystem services.

Progress beyond the state of art

is given by

- a** **upscaling of land-management practices in forestry and agriculture.** Land-cover maps do not provide sufficient information to assess the real lignocellulosic resources productivity and availability on regional level and to evaluate its impact on the provision of ecosystem services.
- b** **linking land-management with regional planning questions.** The interfaces between regional planning and land-management are restricted to the discussion on protected areas and not on how to make better use of possible positive trade-offs of land-based production for the provision of socially important ecosystem services including nature protection
- c** **moderation between land-based production and industrial demands** including optimization algorithms for land-use, resource-distribution and logistic processes. Assessment of land-based production potentials is so far unilateral from industry with missing communication of altered resource needs to planners and land-owners and missing consensus building between needs and production.
- d** **added values:** the virtual regional resource stock market could enhance the up-building of industry clusters and give positive impact to regional economic development in rural areas. For industry, resource supply security could be enhanced, especially since Climate Change scenarios will be taken into account in the assessment of future resource productivity. For land-owners, purchase security for lignocellulosic resources could be increased, including positive impact on prices. Furthermore, the integration of ecosystem services in the evaluation supports respecting added values of land-use for society and could form an additional base for generating income for land-owners.

Innovation potentials

are given by

- a enhancing the cross-sectoral cooperation** between land-use related research (production), social topics oriented research (ecosystem services, participation models) and software engineering (software tools, platform) with an **interdisciplinary end-product** (virtual regional feed-stock stock market for lignocellulosic resources);
- b combining the production and economy** focused orientation of land-use and land-use management **with the ecosystem services approach** to an **innovative evaluation base** for assessing the impact of land-based production and of alternative land-use scenarios as response to altered societal demands;
- c developing advanced approaches for participatory processes** in the industry - land-owner - citizen communication on regional level using visualization and mobile IT platforms for data collection and evaluation, to establish improved models how to make better use of complementary potentials of forestry and agriculture under consideration of possible trade-offs (ecosystem services) and future Climate Change scenarios.

Relevance for producers and consumers

Strategies how timber industry and energy providers get access to lignocellulosic resources are highly variable in Europe. As main common challenge, an **increasing scarcity of such resources** can be observed. This is a response on the demand of the EU climate and energy package that 20% of EU energy consumption should come from renewable resources. In consequence, **concurrence in the use of lignocellulosic resources for wood products or energy production** occurs in most countries. This has a considerable **impact on the market behaviour and economic fitness of timber industry and energy providers** by a distortion of price relations between timber for wood products, pulp and paper and energy production. In result, **smaller companies in rural areas disappear** and the **access of small-scale (private) land-owners to timber markets becomes worse**. Discrepancy between resource needs and the access to resources by a **missing link between the timber users and the land-owners** is a reason, why biomass from short rotation forestry is not used for energy production to the extend it could be used to correspond to the climate change protection targets on EU level: a **missing common market place hinders the communication** between energy providers and especially agricultural land-owners, who - in consequence - can not identify an economic benefit in switching from agriculture to short rotation plantations. **Bioenergy crops on agricultural sites buffer the increased demand for biomass only to a limited extend**, as the production of food has often higher priority. Stakeholder groups, who can benefit from RegioPower and will be involved, are:

- (a) land-owners** (farmers, foresters, governmental / non-): scenarios and trade-offs of increased production of lignocellulosic resources, alternative land-management practices, regional preferences in ecosystem services, income from land-use (purchase security for products)
- (b) industry** (energy providers, timber industry, other investors): conception of the feed-stock market, improvement of logistic processes, resource supply security and investment decisions
- (c) regional planners and managers** (e.g. ILE regions / EFRE): balance between economic development and ecosystem services, validation of planning scenarios for regional development planning
- (d) citizens** (represented by NGO's): regional economic development / ecosystem services

Relevance for regional development, human health and well-being

To **avoid negative impact from increased lignocellulosic resource demands on ecosystems and their services for society** is the most important challenge. **Overuse of forests** can occur where timber resources are easily available as a result of environmental parameters (topography, soils), technical parameters (infrastructure) and social parameters (ownership type). This can endanger biotope networks, impact drinking water quality and can also lead to increased costs to regenerate such forests. **Unilateral focusing of agriculture on the production of bioenergy crops** such as maize or rape endangers the functioning of soil processes, can lead to increased soil erosion with negative off-site impact and higher nitrogen charges in the ground and surface water. Use of corn for energy production might endanger food supply. Establishment of short rotation plantations or agroforestry systems can impact the economic situation of the land-owners and provoke high capital input at the beginning to establish the plants and later on to adapt the harvesting technologies. To **mitigate** such **possible trade-offs**, regional **optimization of land-cover** and -management offers the opportunity to **overcome scarcity** in the availability of lignocellulosic resources, **strengthen rural economy** and increase or maintain the **provision of ecosystem services**.

In result, the **need for an instrument** can be identified, which provides both - **(a) a market place**, which moderates between lignocellulosic resource needs from industry and energy providers and the regionally available resources available from land-based production and **(b) a feed-back** to regional development planning and land-owners to optimize land-use and -management with the aim of increasing lignocellulosic resource production without endangering the provision of ecosystem services to regional society.