



EGEC's response to the EC Public consultation exercise on the Green Paper Towards a Secure, Sustainable and Competitive European Energy Network

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Make Europe the most energy import independent region of the world- Renewables for Security of Energy Supply, Competitiveness and Environmental Protection

EGEC welcomes the intention and initiative of the European Commission to show the path towards a secure, sustainable and competitive European energy network.

EGEC is committing itself to actively support a transition into an energy economy which is fair to all EU citizens, provides a level playing field for all actors on the EU scene, and aims at the goals of efficiency, sustainability, security and conservation of the local and world-wide environment.

EGEC hence will co-operate with all levels of EU politics, administration and industry to achieve these goals.

Network Policy

1. What do you consider to be the main barriers to the development of a European grid and gas network? How far can they be addressed at national/regional level, and when should the EU act?

As underlined by the Green paper, administrative and regulatory barriers hamper the development of a European grid. For geothermal power, it is crucial to simplify national/regional regulations and administrative procedures, and to adopt a licensing procedure that also clarifies the geothermal resource ownership. Setting priorities among natural resource use in a law in this order will help: Potable water, balneological, water for agriculture, renewable energy, conventional energy and auxiliary uses of the underground, sports&recreation water use.

Another important barrier is unfair competition: We have not yet achieved effective competition in the EU electricity and gas markets. Although liberalisation of electricity and gas markets has shown some benefits much more remains to be done. At present all EU electricity and gas markets, except in Nordic countries, remain national in

economic scope. For almost all countries, imports of electricity and gas are not yet sufficiently developed to provide customers with a real alternative to the nationally established suppliers. There is no real competition on more than 90% of the EU electricity market, and unless the current distortions in the emerging Internal Electricity Market are overcome, there will be no effective Internal Renewable Electricity Market for Renewables to compete in. Creating real competition in the Internal Energy Markets is a vital goal in securing European competitiveness.

In most national markets, customer switching rates are modest, substantial barriers remain for new entrants, market structures are highly concentrated and, last but not least, a single European energy market has not been achieved.

In all but five of the 27 Member States the three largest utilities own above two thirds of the electricity generation capacity. The figures even understate concentration as they do not take into account a very high degree of cross ownership. The level of dominance is even increasing as rules and practices continue to support the incumbent European generators and technologies and are encouraged by some Member States as utilities are built up to become national champions, or are becoming part of a handful of European utility oligopolies.

Moreover, if the EU wants to guarantee security, stability and prosperity in and around Europe, an ambitious and coherent energy policy is a crucial requirement. Such a policy should rely on a common political will include the necessary means to provide collective answers to the economic, social, environmental and more generally strategic issues which coalesce in the energy equation. In line with the treaties of the Union has to respond to security of energy supply, economic growth, sustainable development, climate change, employment and technological development.

Only renewable energy technologies, like geothermal energy, in combination with energy conservation and efficiency have a positive effect on all of these goals.

By definition, geothermal energy is the energy stored in form of heat beneath the earth's surface. It has been used since ancient times for heating, and for the last 100 years, also for electricity generation. On a human timescale, geothermal heat is an inexhaustible source of energy, comparable to that of the sun.

Geothermal energy is a sustainable, renewable, nearly infinite energy source, delivering heat and power 24 hours a day throughout the year, and is available all over Europe.

Until now we have only used a small fraction of the underground heat reservoir potential.

2. What circumstances justify an EU intervention in local planning disputes related to energy infrastructure? In those circumstances, what should the EU do?

A strategic and coordinated effort by the European Union and the Member States is necessary to tackle the local planning disputes, barriers against the development of a European grid and gas network.

All Member States have developed their own regulatory framework. Consequently, one of the first contributions made by any **European energy policy** should be to provide a truly **pan-European perspective** of these key issues, along with a benchmarking of the projects undertaken and an interconnection of the resources available.

The EU could nominate a European moderator to manage local planning disputes having in mind the main EU priorities:

- Renewable energy
- Energy efficiency
- Security of supply
- Distributed generation
- Energy infrastructure
- True Electricity and gas liberalisation and competitive markets: For a truly competitive market, the full ownership unbundling of the vertically-integrated power companies is necessary
- Competitiveness

3. Is a more focussed and structured approach to research and demonstration relating to European networks needed? How should it look?

Electricity and gas transmission infrastructures (notably interconnections) are insufficient. Research and development relating to European energy networks are needed.

Due to its transnational implications, and despite an initially limited constitutional responsibility in energy matters, the EU has progressively attempted to address an increasing number of individual issues related to energy, often taking the lead and pushing forward innovative legislation or spreading national best practices between Member States. Such was for instance the case in the areas of electricity and gas market liberalisation, renewable energy sources and some aspects of energy efficiency. In many other cases, such as research policy, the EU programmes have only come in support of local or national initiatives and capabilities.

The integration of new energy technologies in the grid is a challenge:

- Energy from wind and sun will play a significant role in the future. The network will need to be flexible.
 - **Geothermal energy will also have a major role, to assure this flexibility: A major advantage of geothermal energy is the availability of the resource all day and night, throughout the year: a load to the grid, operating up to 100% of time (the best ratio of all energy technology !).**
- The concept of Enhanced Geothermal Systems (including the classical Hot-Dry-Rock-idea) will tremendously increase potential.
 - Innovative power plants permitting the production of electricity using low thermal water temperatures of the order of 100 °C, with larger plants using clusters of wells, and for micro-generation will also gain importance.

- Developing Hybrid systems for heating & cooling but also for electricity (beneficiating from the geothermal base load ability) with biomass, solar, etc. are also promising for the future.

4. What do you think is the most important activity for the EU in network development?

New power grids essential to achieve EU climate and energy goals, we need to extend our power grids and change the way we operate them.

An extended grid with changed operating procedures is necessary to rejuvenate the EU's power system, and will help reduce its operational costs

An upgraded grid would, however, also allow larger amounts of geothermal electricity onto the system. As such, it would go a long way in helping the EU meet its 2020 targets, reduce CO₂ emissions and ultimately make electricity more affordable for consumers.

We need to adapt the infrastructures: advanced engineering materials and electricity networks are needed for the future. We have to create the network of the 21st century: secure, sustainable and competitive; it means integrating all RES and notably geothermal energy.

Geothermal energy has been used for the last 100 years for electricity generation. Electric power production on low enthalpy geothermal fields is now activated and the first electric power has been generated in Soultz-sous-Forêts in an Enhanced Geothermal System (EGS)-plant, after many years of work.

In January 2009, EGEC published a geothermal research agenda fixing the research priorities for all geothermal technologies until 2030, in order to decrease costs:

- **by 30% for conventional geothermal power (flash and dry steam): reach 20 €/MWh_{el}**
- **by 50% for low enthalpy electricity production: reach 50 €/MWh_{el}**
- **by more than 50% for EGS: reach 50 €/MWh_{el}**

5. Should the EU be more involved in facilitating infrastructure projects in third countries? If so, in what way?

The EU should be more involved in facilitating energy infrastructure projects in third countries, to allow security of supply and to mitigate climate change through joint projects.

When EU undertakes joint projects with a third country regarding the generation of electricity from renewable sources, the EU should facilitate the concerned country or countries' domestic use of part of the production from the installations covered by the joint project. Furthermore, the third countries involved in joint projects should be encouraged by the EU to develop a renewable energy policy including ambitious targets.

Noting that projects of high European interest in third countries, such as the Mediterranean Plan, may need a long lead-time before being fully interconnected to the territory of the Community, it is appropriate to facilitate now their development and the construction of the interconnection.

Geothermal energy has the advantage to be present everywhere, every time. Indeed a major advantage of geothermal energy is the availability of the resource all day and night, throughout the year: a load to the grid, operating up to 100% of time (the best ratio of all energy technology !).

Geothermal projects can be developed in all countries.

TEN-E

6. What sort of support should the EU provide to developers of new energy networks to have the greatest impact, considering that resources are limited? Is the approach of TEN-E still relevant? How can the EU help improve the conditions for investment?

The EU should help in coordinating the resources. The TEN-E should be developed through a super smart grid to integrate renewable electricity. If the EU's resources are limited, the best approach would not be support, but some sort of **requirement** to develop networks (utilities forced to spend from their own resources or some form of tax).

Moreover, Removing subsidies to fossil fuels and nuclear and applying the 'polluter pays' principle - established in Article 174 of the Treaty - to the energy markets, would go a long way to level the playing field.

One of the main barrier to the development of an European grid is the lack of a strong and well-financed public initiative on the basis of long-term plans.

The EU should act directly on cross-border lines, and get involved in the setting of the goals for national and regional policies (f.e., requiring that grid policies are aimed at ensuring access to the grid for new renewable producers).

Long-term European research should focus on developing efficient, economic and environmentally friendly energy solutions. FP7 (the seventh EU Framework Programme for Research and Technological Development) should be used as the main instrument for setting priorities, orienting research and supporting promising ventures. Its goals should be to concentrate not only on new technologies, but also on improving the delivery of better techniques. The research efforts under this programme need to be pushed further. They need long-term commitments in financial and manpower terms, as well as favourable conditions, and support from the public and private sector (in the form of Public Private Partnerships), such as those available in the existing or proposed technology platforms.

7. In view of the proposed revision to the TEN-E guidelines, how can the EU improve the focus, effectiveness and impact of the TEN-E policy within its existing budget?

The development of renewable energy projects, including "renewable energy projects of European interest" under the Trans-European-Network for Energy (TEN-E) Programme should be accelerated. To that end, the Commission should also analyse how the financing of such renewable energy projects can be improved. A particular attention should be paid to renewable energy projects that will contribute to increase significantly the energy security in the Community and neighbouring countries.

Cross-border/transnational/interregional cooperation shall be promoted.

8. Should TEN-E be extended to oil infrastructure? Should it also be extended to new networks for CO₂, biogas or other networks?

TEN-E should be extended only to new networks for renewable energy sources, if we really want to have a secure, sustainable and competitive European energy network.

9. Do you have views on, or suggestions for new priority projects which the EU should give backing to?

proposal for SET-plan:

***Suggestion for initiative on geothermal energy SET plan – EGS
Geothermal Power Production everywhere through EGS***

With geothermal energy you have a load to the grid, operating up to 100% of time (the best ratio of all energy technology !)

The concept of Enhanced Geothermal Systems (including the classical Hot-Dry-Rock-idea) will tremendously increase potential.

After more than 30 years of R&D efforts, electric power generation using EGS technology now is demonstrated. However, to unleash the full potential of EGS, a concerted action is required to transfer the technology to other sites in similar geological situation and later to sites in all possible geological framework.

A major effort to introduce EGS could create a substantial base-load electric power production, as geothermal energy is available independent from the time of day or year, of climate, weather, etc.

A steady increase in geothermal power production could be expected in all EU countries.

Objective

The sole objective of the initiative would be to proliferate the technology of Enhanced Geothermal Systems (EGS), from the one European R&D- and pilot-site in Soultz-sous-Forêts (Alsace, France) to other Member States and to different geological situations.

A target of the initiative will be to create about 20 (a minimum of 15) operating EGS power plants; the first group within geologically similar regions, the second group in other regions with favourable conditions (geothermal anomalies, crystalline rocks in suitable depth, tectonic stresses), and the third and last group in regions without any special advantage for EGS use.

Each power plant should have an installed capacity of at least 5 MW_{el}, with increasing size for replication of plants in similar category. The goal should be to have at the end of the program about 300 MW_{el} of installed power operational, producing base-load energy with a load factor of >90%, and thus generating about 1580 GWh of electricity each year.

10. Would it help TEN-E/EU to gain more impact and visibility if it was turned into an operational security of supply and solidarity instrument?

Trans-European-Network for Energy should develop renewable energy projects, including "renewable energy projects of European interest".

Turning the TEN-E into an operational security of supply and solidarity instrument would get the EU more visibility

11. What additional EU measures beyond those mentioned in this Green Paper would help secure a sustainable infrastructure for the EU?

Immediate Recommendations

To fully explore the potential of renewable energy and energy efficiency the EU should immediately act in the following fields to start with:

- Improving legislation on renewables the transformation of it in the Member States not only in it's words, but also in it's spirit
- Increased research funding under FP7 with clear budget allocation for renewables
- Development of a renewable energy export strategy

Comments

Geothermal energy is not mentioned in the green paper although references are made to renewables:

- Page 6: 2.4. Moving towards a fully integrated and flexible European energy network

*It is also essential to ensure that all parts of the EU are able to benefit from the new energy resources being developed in the EU, such as offshore wind, **geothermal power** and photovoltaic/concentrated solar power, through more inter-regional links.*

- Page 7: 3.1.2. Achieving the "20-20-20" targets by 2020

*The EU needs to promote projects which can carry power from resource-rich areas (e.g. wind in coastal areas, **geothermal energy in regions with favourable geological conditions** and solar in the Mediterranean) to where consumers need it. At the same time, new grid technologies must be promoted for a more efficient and flexible use of local energy sources, for example power generation in individual households and combined heat and power.*

- Page 8: 3.1.3. Innovation and new technologies

The Strategic Energy Technology Plan also includes measures important for future network development, such as the action on transition planning towards low-carbon energy systems.

Another issue which should be further researched is the impact of electric and plug-in hybrid vehicles on electricity networks.

Another proposal to add to the SET-Plan is the initiative on geothermal energy – Geothermal Power Production everywhere through Enhanced Geothermal Systems.

- Page 12: 3.3.2. Other options for enhancing TEN-E

*A further option is to move away from specific projects to **general studies** aimed at developing solutions to current challenges facing network developers, e.g. how to resolve network issues associated with the large scale connection of offshore wind or solar or the use of "smart" grids, **by developing geothermal power production providing the base load.***

- Page 14: 4. CONCLUSIONS

***A Mediterranean Energy Ring:** The Mediterranean area and Africa also need to be better connected not only for fossil fuels but also for renewables. A Mediterranean energy ring will enable Europe and North Africa to better exploit natural resources available there.*

*This initiative will build on the proposal made within the context of the Union for the Mediterranean - Barcelona Process, of a Mediterranean grid feeding electricity from solar energy (PV and concentrated solar power), **geothermal energy** and also wind into the EU. Interconnection projects with the European mainland would also significantly enhance the energy security of the most isolated European countries.*

The targets set for the geothermal sector for 2030 are to contribute to 5% of the total electricity production in Europe, and 3,5 % of the total heat generation. Geothermal energy is today the 4th RES provider to the total final energy consumption (behind Biomass, Hydropower, and Wind).

A Renewable energy mix can not be reached in the future without geothermal energy: don't ignore it now, the future is there !

> A major advantage of geothermal energy is the availability of the resource all day and night, throughout the year: a load to the grid, operating up to 100% of time (the best ratio of all energy technology !).

As demonstrated in numerous sites since already 1904, heat from the underground can be converted into electricity. The relevant resources are far from being fully developed in Europe. The concept of Enhanced Geothermal Systems is going to add a tremendous increase to the potential. Innovative power plants permit the production of electricity using low thermal water temperatures of the order of 100 °C.

Installed capacity is almost 1000 MWe of electric, with ca. 8 TWh electricity production per year.

In 2020, geothermal electricity installed capacity would reach 6000 MWe for EU-27, and producing 50 TWh.

<u>Geothermal Electricity - EU-27</u>	2007	2010	2020
Electricity conventional (MWe)	815	920	1200
Electricity – ORC (MWe)	15	70	300
Electricity Enhanced Systems (MWe)	-	10	4500
Total Installed Capacity (MWe)	830	1000	6000
Yearly Electricity Production (TWh)	6,5	8	50