

Saarland

Regional RES-e Map: Electricity from renewable energy sources (RES-e)

The region	Saarland
Number of inhabitants	1.01 Mio
Size (in km²)	2,500 km ²
Capital	Saarbruecken



Short description:

The Saarland is located in the Southwest of Germany at the triangle between France and Luxemburg. Born from a former mining and steel dominated industrialised region it is today in a transition phase to a more IT- and service oriented working society with a strong focus on car producing industry including component supplier. Conventional and modern energy industry holds also a strong brand position in this region. Around the world culture heritage “Alte Völklinger Hütte” further tourism attractions shall show the other and more green face of this German ‘Bundesland’.

Share of RES (total primary energy): 0.9 % (1996 no later assessment available)
(Germany 3.0 % in 2002)

Share of RES-e (total electricity): 1.8 % (1996 no later assessment available)
(Germany 3.1% in 2002)

Target RES-e (Germany): 12.5 % (2010),

The partner organisation: The AZES GmbH (agency for future energy systems) as the regional energy agency of Saarland, promotes EE, RES & innovative technologies not only through studies and advice but also through concrete realisation and third party financing. Azes (former SEA) was well known as OPET CORA within a series of European projects.

	number of plants	Total installed capacity (MWel)	Typical installation size	Main present funding mechanism	Short-term perspective (2007)	Mid/long-term perspective (2015)	Main barriers
Wind	53	56,8	1500	feed-in tariff + ERP + DtA support	75 MWel	> 150 MWel	Citizen initiative against wind; Bureaucracy, planning conditions; to less political enlightenment;
Wood biomass	1	2,6 MW	3 MW	feed-in tariffs are economically sufficient	low	middle	lack of mature small-scale technology; lack of low price wood as wood residues are mainly exploited
Biogas	5	1 MW	50 kW	feed-in tariff, investment subsidy	1,9 MW	3,5 MW	heat selling is often insufficient; instable future of many farms;
PV	>1,100	8,5 MW	3 kW	high feed-in-tariff (EEG)	High	High	high investment costs;
Hydro <10 MW	23	16	40 kW; 500 kW;	feed-in tariff	Low	Low	Main potential already used; too small unities; construction costs too high
Other: rape-seed oil	1	0.012 MWel	12 kW	Special pilot project with high subsidies + feed-in-tariff	Low	Medium	high potential depending on economical frame conditions (reduction of price for rape seed oil and/or higher feed-in-tariff for biofuels
Other: geo-thermal	0	0	0		0	0	No potential

Wind

The past:

The first wind plant was installed in 1994 by a regional energy supplier (225 kW) to demonstrate the viability. Its successful demonstration led to the installation of the first wind park with 8 converters and 4.3 MW power in 1995.

An enlargement to 8 MW followed until 1998. Higher new feed-in tariffs since 1999 started a certain boom.

The present:

Presently 53 windmills with 56,8 MW in total are in operation. New plants are now equipped with 1.5 MW wind converters.

Main funding:

Feed-in-tariff between 5.5 Eurocent and 8.70 Eurocent per kWh (national) plus regional investment subsidy for complicated grid connection costs and infrastructure measures

The main barriers & strategies to overcome them:

A stronger growth is blocked through regional administrative barriers (distance of 1000 m from next housing which destroys many new projects) and local citizen initiatives against this technology. The wind promoters try to convince the regional administration for better frame conditions. A public image campaigns in favour of wind power seems to be necessary to overcome anxieties of the population.

Short-term perspectives (until 2007): Even though strong wind blows against new projects, there is a good chance to reach doubling of the present size because of the good financial frame conditions

Mid/long-term perspectives (until 2015):

It is supposed that the advantages of windmills will step by step recognised by the relevant local administration to support the wind exploitation potential



Wood biomass



The past:

Electricity generation from biomass was only profitable if the heat could be used within industrial processes. So only one installation with more than 17 MW thermal power was installed around 1990. The electrical output was 2.6 MW.

The present:

There was one 20 MW electrical power cogeneration plant planned. But due to a citizen initiative and relatively weak arguments during the authorisation process the project failed. Further projects are not expected as the fuel supply with cheap industrial wood residues is already completely contracted within other running projects.

Main funding:

Feed-in tariff of 11.5 cts/ kWh (limited to a size of 150 kW), 9.9 cts / kWh (below 500 kW), 8.9 cts/ kWh (below 5 MW) and 8.4 cts/ kWh (below 20 MW)

The main barriers & strategies to overcome them:

Conventional combined heat and power systems (turbines, damp engines) have a too low electrical output share (20 – 25%). Higher efficiency rates of 30 or 35% can be reached with gasification units currently not proven. Meanwhile the market of industrial wood residues is empty. But the high potential of wooden forest residues remains completely unused because of higher prices. It seems as if the feed-in-prices for forest wood is not sufficient and should be adapted.

Short-term perspectives (until 2007):

There are two 5 MWel pilot plants with forest wood and innovative gasification technologies in the planning phase. With a support of the regional ministry one plant will probably be realised.

Mid/long-term perspectives (until 2015):

The break-through of small-scale gasification will open the market for lots of local wood industry applications. Together with privileged feed-in-tariffs for forestall wood biomass will be a booming technology.

Biogas

The past: The first plant at a farm with 30 kW was built in 1991 by SEA. Only after the start of EEG, in 2000 and 2001 two further farming plants were realised with around 100 kW.

The present

In 2003 with SaarEcoEnergie a new actor started in the market. It was running a co-fermentation biogas plant with nutrition residues. But the company lost completely their control over the fermentation process so that the plant failed. As a strong bad smell was troubling the citizens, this was a highly negative example. The company was bankrupted and the plant was deported.

Important companies:

Novatech, LEE, Ökofit, VSE Lockweiler

Other stakeholder & market actors in the region:

IZES, AZES, Ökostrom Saar GmbH, Gesellschaft für nachwachsende Rohstoffe e.V.

The main barriers & strategies to overcome them:

With the improved feed-in-tariffs for biogas plants on the basis of liquid manure and energy crops such plants could be driven with profit. But the general funding is a problem as the bank viability of many farmers is relatively low. Another main barrier is to find an appropriate use of the heat which is produced by the cogeneration units. For both cases co-operations are necessary to find potential heat consumers and further financiers.

Short-term perspectives (until 2007):

There are a series of prospective project ideas for further demonstration plants. The perspective is medium.

Mid/long-term perspectives (until 2015):

With regard to the higher competition, improved standardised systems and the need for the farmers to create new income opportunities the energy farmer will relatively well exploit the biogas potential in the coming years.



PV

The past:

Due to a relatively good regional support scheme since 1990 and higher voluntary feed-in tariffs from the regional utilities the Saarland was able to reach a promoting role for PV. Together with the EEG the grants were ending. Then Saarland projects were under-represented e.g. with only 1% share in the 100,000 roof programme.

The present:

The private sector is running relatively well. The typical size is around 3 kW peak. More and more commercial oriented initiatives are successfully implementing bigger plants of 10 – 50 kW. They build share consortia and profit from free rented city roofs. In the last 2 years three big MW plants are erected within the region on typical recycled industrial sites e.g. of former mining areas. At the end of 2004, in Saarland the installed capacity was at 8,5 MWp in the PV-sector.

The main barriers & strategies to overcome them:

PV prices are actually economical viable. But due to delivery problems of modules many of the planned PV plants can not be realised during this year. In the next year the feed-in-tariff will decrease but due to the high demand the prices for PV modules will probably not fall with the same percentage; so the attractiveness will be reduced rapidly. This will be negative for the whole market. As there are new capacities for higher output of PV modules envisaged, the price reduction should be able to follow the lower feed-in-tariffs.

Short-term perspectives (until 2007):

The feed-in-tariffs are relative attractive especially when bundling projects. Falling prices because of competition in the solar industry will lead to a run for the best and biggest sites.

Mid/long-term perspectives (until 2015):

As the cost reduction potential is high and the public opinion in favour of this technology the PV boom will proceed also after 2005. The further PV potential exploitation will strongly depend on the ability to follow the curve of the lowered feed-in-tariffs for PV.



Small hydro (< 10 MW)

The past:

There are three typical system sizes realised during the last 50 years: one category reaches from 10 to 40 kW and encompasses the very small rivers with old water rights available. A 2nd are medium-sized plants between 150 and 500 kW, a promising but still economically risky potential. Finally the main river Saar was equipped with dams and weirs to exploit this potential: they have sizes from 2 to 6 MW electrical power.



The present

So in fact this main potential is already used. It remains only one weir along the river Saar with a capacity of 500 kW. In addition micro hydro plants create a further potential of 400 kW as a maximum.

The main barriers & strategies to overcome them:

Distinctively prove the profitability these small and risky hydro power projects.

Short-term perspectives (until 2007):

low

Mid/long-term perspectives (until 2015):

low

OTHER RES-e: Rape-seed oil

The past:

Only one small 12 kW cogeneration engine on the basis of rape-seed oil was realised in 2002 as demonstration island plant

The present

No further projects are planned as the economic viability is still not yet given.

The main barriers & strategies to overcome them:

The feed-in-prices are still too low for that type of RES technology; they should be increased to allow a profitable realisation and install the necessary infrastructure.

Short-term perspectives (until 2007):

low as adequate political initiatives are not successful

Mid/long-term perspectives (until 2015):

medium as increasing oil prices are improving the competitiveness



Main market actors

The market actors in the region are utilities, energy suppliers, craftsmen, plant manufacturers and NGO's. The number of craftsmen installing and maintaining res e plants ist rather important, but unfortunately there are no figures available. The chamber of handicraft is of the oppinion that every electricien today also offers and promotes the installation and maintenance of PV plants.

1. On the wind sector

- Vensys: specialised on gearless wind converters for inland windmills with 600 and 1500 kW;
- Saarland Windpark GmbH&Co KG
- WIND7 AG
- Boreas (Dresden)
- Abowind
- NET (Trier)

2. On the biomass sector

- VSE, energis
- SaarEnergie

- Stadtwerke Saarbrücken AG
- Pfalzwerke AG
- Naturlandstiftung Saar
- Saarforst GmbH
- IZES
- AZES

3. On the PV sector

- Boss electronic
- MSE
- Helux
- KS KommunalSysteme
- City Solar AG
- ARGE Solar
- AZES

4. on the hydro sector

There are no actors in this field in our region

5. other Res e

- Gesellschaft für nachwachsende Rohstoffe e.V.
- Sankt Wendeler Ölsaaten

Conclusions

In the region of Saarland we are rather far away from the average of res-e electricity production in Germany (3,1%). Therefore the res e regions project can really be an instrument to boost res electricity. On the wind and PV sector the number of plants was increasing very clearly in 2004 and because of the federal promotion programme, which is based on feed in tariffs for res-e electricity in the public grid, also PV will boom.

In Saarland there still exists a funding programme for PV in schools and necessary infrastructure measures before erecting further wind converters. But there are more and more citizen protests against wind plants and so it is getting more difficult to implement more of them at the moment.

Because of the promising increase of the PV sector in Saarland, AZES decided to select medium sized PV plants as key technology. In 2004 and 2005 beside the small PV plants of 1 to 5 kW on private roofs especially very big plants over 1 MW were installed. But the medium sized PV plants in a range of 10 – 200 kW are underrepresented. Even though there are a lot of free roof capacities especially on production facilities, on shops and farms the investment in such plants is quite low.

Craftsmen such as electricians, carpenters, slaters but also chimneysweepers and farmers often own facilities with big roofs. These branches should be convinced to install own plants

on their roofs and later to use these pilot plants as advertisement for private house owners or public administrations. Beside them further lighthouse projects could be implemented on big roofs on local supermarkets to visited by many people who probably get more interested in these projects after seeing such examples . Further target groups could be local politicians and decision makers for building PV plants on public roofs as well as local utilities and district heating operators.