CASE STUDY

Transforming the lignite-fired Matra Power Plant into part of a renewable energy cluster

The Matra Power Plant is an example of a coal power plant transitioning into an industry cluster in which renewables play an increasingly important role. These efforts do not only retain the electricity generation capacity, but keep jobs in the region.

DESCRIPTION

Location: Visonta, Northern Hungary
Type of action: conversion of industrial site, cluster partnership
Actors: power generation company (private majority)
Financing conditions: public investment, state subsidy, Feed-in tariff (PV, biomass)
Fund(s): EU Fund: ERDF (for the development of a cluster member)
Type of coal: brown coal
Region: rural
GDP: below national average
Unemployment rate: above national average
Population: declining population, ageing society

KEY POINTS

APPROACH

- Cost efficient site conversion of old coal mines by deploying them for renewable energy production (biomass and solar)
- Retaining the electricity generation capability and employment capacity with reduced coal use
- Establishing an industrial park cluster

ENABLING CONDITIONS

- Availability of tax allowances and feed-in tariff for renewables
- ERDF funding for companies in industry cluster

CHALLENGES

- The region is structurally relatively weak, following the industrial sector's decline; the unemployment rate is higher and the GDP/capita is lower than the national average

ACHIEVEMENTS

- With a current solar capacity of 60 MW, and a planned expansion to reach 200 MW, the Matra Power Plant leads the way for renewables in Hungary

Energy

THE START OF A LONG-TERM STRATEGY

In 2004, the Matra power plant started utilising biomass. This was not only a first step towards the use of more renewable sources in power production, but also the start of a new long-term strategy. At that time the Matra PP created an industrial park, which made it possible for further companies to set up and maintain a cluster together with the power plant.

Introduction

Although there is no official phase-out date for coal in Hungary, Hungarian power plants and coal mining areas must start adapting and restructuring their profile to the changed circumstances of the energy sector.

The Matra Power Plant (further Matra PP) is an example of a coal power plant transitioning into an industry cluster in which renewables play an increasingly important role. These efforts do not only retain the electricity generation capacity, but keep jobs in the region. The concept includes the development of an industrial park (IP) in order to create a cluster partnership with established companies in a region that is considered rural and structurally weak. It is also an example of a cost-effective approach to the industrial conversion of exhausted coal mines through the use of energy forests and photovoltaics (PV).

In 2004, the Matra power plant started utilising biomass. This was not only a first step towards the use of more renewable sources in power production, but also the start of a new long-term strategy. At that time the Matra PP created an industrial park, which made it possible for further companies to set up and maintain a cluster together with the power plant. The strategy aims to attract companies and create a business relationship with them that is beneficial for both sides. The usage of surplus heat (e.g. from steam) from the power plant and the local utilisation of by-products from the companies in the industrial park is a central element in the cluster strategy (see figure below for cluster partnerships realised so far).

The cluster strategy depends on the ability to secure a cost-effective heat and power supply even though in the long-term the use of lignite will be reduced (irrespective of whether this occurs sooner or later and whether it is motivated by climate reasons or the depletion of coal fields in the region).

Consequently, Matra PP has decided to exploit the potential of decommissioned mine sites for energy supply, using them primarily for biomass production and photovoltaic power plants. For the owners of the power plant and mines, this also has the advantage that costs for site conversion to energy forests and a solar park were estimated to be much lower than for other uses like agriculture or tourism. The biomass utilisation, which is mainly agricultural and forestry organic waste, is partly supplied by alternative resources such as Solid Recovered Fuel (SRF) and Refuse Derived Fuel (RDF), as well as resources from energy forests owned by the power plant. Regarding the energy forests, the Matra PP started a 20 ha pilot project and has plans to extend this. In addition, in 2015 a 16 MW photovoltaic power plant (the biggest in Hungary at that time) was installed as a re-cultivation measure on an ash deposit heap within the former mining site. The project was financed by the Matra

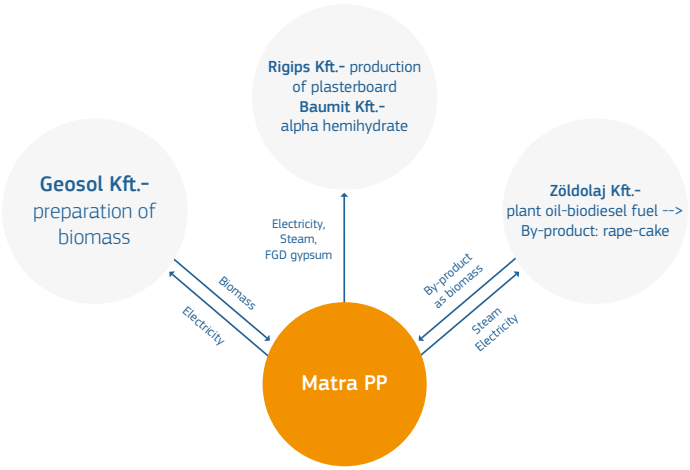

Figure 1

CLUSTER RELATIONSHIPS IN THE MATRA POWER PLANT INDUSTRIAL PARK

PP with 50% of the investment covered by tax allowances. The solar portfolio has been further extended with the installation of a 20 MW plant in another former mining site last year, located at a connected mine field 60 km away. A further 20 MW will be added in the near future.

16 MW

PHOTOVOLTAIC POWER PLANT

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The industrial park is currently exploring new business opportunities to further diversify its portfolio, particularly with a long-term perspective of reducing lignite power production capacity. Different concepts in line with a decarbonisation strategy exist, all of them in different development stages, either at a feasibility assessment preparation stage or the implementation stage. The concepts include: RDF (Refuse Derived Fuel) fired combined heat and power unit, 450 MW gas-fired combined cycle power plant unit, 100 MW biomass unit, 600 MW pumped storage, 50 MW battery storage (connected to the PV plant), expansion of the PV plant up to 200 MW, and a solar panel factory.

Challenges

The activities in Matra strongly depend on the national energy policy framework. Conditions have been supportive towards the installation of biomass and PV to date. However, the revision of the national energy strategy influences the implementation of further actions within the development plan (e.g. the 600 MW pumped storage plants, which would be a significant project at national level).

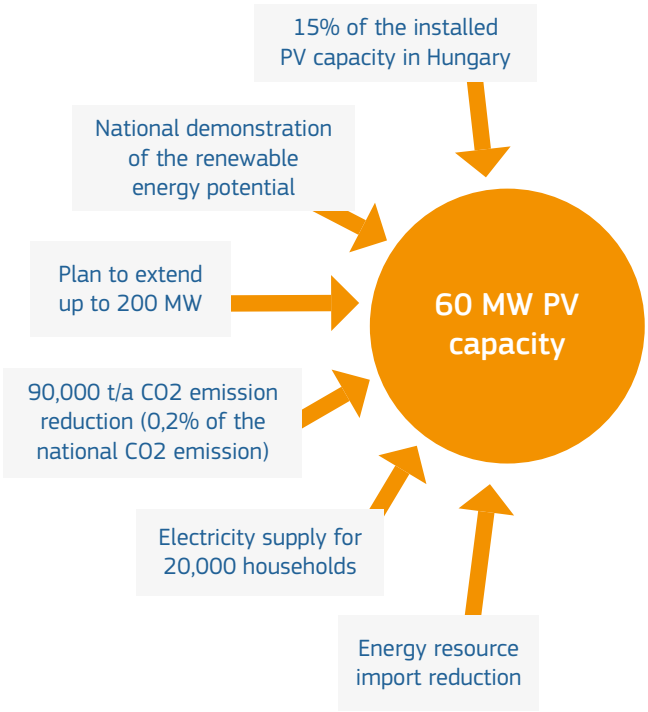
The Matra PP company is currently exploring options for partnerships with investors/investor groups' and/or further public support to implement the development concepts of the power plant. This is no easy task given that the region of Northern Hungary is structurally relatively weak. It has rural characteristics (150 km distance to Budapest) and still suffers from the impacts of the industrial sector's decline following the end of the communist era in the country. The region's unemployment rate is still higher and the GDP/capita is lower than the national average. Even though Heves-county, in which the Matra PP is located, has a better economic outlook than the greater region, it is still generally difficult to attract investors.

The activities of the Matra PP are - quite naturally for an industrial player - largely driven from a business perspective. They are not explicitly embedded in a regional development strategy. As much as the activities do support local economic development and job creation, an extended, more holistic regional strategy may prove even more rewarding. One example is the installation of the PV systems: this was carried out by an Austrian-Romanian-Hungarian consortium, with none of the involved companies located in the region. Thus, the PV installation did not advance local businesses.

Enabling conditions

The availability of funding has been proven to be a key factor in the success of the activities at the Matra PP. The shift towards biomass and PV has been enabled through the national support schemes for renewables (feed-in tariff schemes and tax exemptions for PV).

In the case of the industrial park, Geosol Kft., which provides biomass and RDF resources for the power plant, has received a significant amount of ERDF funding (app. 1,5 million EUR) for the company's set up and development.



Achievements

Regarding job creation, the cluster strategy in the industrial park and the regional biomass use can be considered to have had (and will continue to have) a positive impact, securing long-term employment opportunities in the region. Specifically regarding the PV plant, the company made an assessment before the installation of the 15-30 MW PV plant that 135-270 new workplaces could be realised with the plant installation.

The solar energy production of the company is remarkable in Hungary. The total 60 MW PV corresponds to 16% of the total installed national PV capacity. That makes the company one of the front runners of renewable energy utilisation in the country. With the production of biofuels, it is further reducing the nation's dependence on imported energy resources. The co-firing of biomass is an interesting short-to-midterm transition approach which helps to reduce CO_2 emissions, maintain infrastructure assets, and keep local jobs. However, in light of the EU's long-term vision of a net-zero carbon economy and the limited availability of biomass resources, it cannot be seen as a long-term strategy and transferability at scale to other coal regions may be limited.

IMPORTANT LEARNING POINTS

- The Matra Power Plant is an example of renewable energy utilisation with a nation-wide significance in Hungary.
- It shows that the use of renewable energy sources at a coal mining site can smoothen the transition away from coal; by diversifying resources the energy generation capacity was maintained and in doing so, jobs were created and kept in the region.
- Furthermore, extending the use of Biomass and Solar offered opportunities for low-cost mining area reclamation.
- What is interesting is the approach to establish a green industry cluster at the site of the power plant, which combines short-term actions with a long-term strategy for a transition to a low-carbon economy.

Further Reading

https://ec.europa.eu/energy/sites/ener/files/documents/7-5_possible_pathways_for_low-carbon_energy_generation_hungary_zoltan_orosz.pdf

In Hungarian only:

http://www.mert.hu/atadtak-magyarorszag-legnagyobb-naperomuvet
http://www.mert.hu/uj-utakra-tart-a-matrai-eromu
http://www.geosol.hu/cegcsoport
http://www.mert.hu/hu/biomassza-egyutteges

Platform for Coal Regions in Transition

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ec.europa.eu/coal-regions-in-transition
secretariat@coalregions.eu
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