

What is small-scale CHP?

There are many different definitions of small-scale CHP. Small-scale CHP units are run both as heating appliances, providing space heating and warm water in residential or commercial buildings like conventional boilers, and in industries that require heat for their processes. Unlike a boiler, small-scale CHP generates electricity together with the heat at very high efficiencies and therefore helps to save fuel, cut greenhouse gas emissions and reduce electricity costs. The European Cogeneration Directive defines small-scale CHP as all units with an electrical capacity of less than 1 MW. This factsheet will focus on units in this size range. These can be used to provide heating and electricity to district heating schemes, apartment buildings, commercial buildings and small industries. These products are already available commercially.

The COGEN Challenge Project

The goal of the COGEN Challenge project is to facilitate the development of a significant number of small-scale and micro cogeneration projects in European cities and towns, as well as in residential areas and industries. COGEN Challenge has developed a broad range of support tools and structures to facilitate small-scale cogeneration projects. Through these, the project will build local capacity to successfully develop small-scale cogeneration projects. Regional facilitators will also offer guidance and help small-scale CHP investment projects materialise.

Country information



Greece, which has a population of 10.7 million, and a land mass of 131.940 sq km, joined EU in 1981 and the Euro zone in 2002, has a small but fast developing economy. Tourism is a vital source of revenue and the service sector dominates the economy, accounting for 71 % of the total GDP.

Prevailing thermal power generation (90%) is mainly based on lignite (64%) and oil, with natural gas increasing its share in recent years. Till 2001, vertically integrated Public Power Corporation (PPC) still enjoyed a monopolistic position in the electricity market. Only around 3.4% of the country's electricity generation is produced by CHP, which has a total

installed capacity 488 MWe (mainly backpressure turbines and gas turbines) and generated 3.3 TWh of electricity in 2003, of which only 1 TWh qualified as CHP electricity. CHP statistics for Greece vary widely and should only serve as general indications.

Market Potential & Environmental Benefits

The number of small scale CHP units is very small (5 units in 2002). Some new units, mostly in hospitals and clinics, either in the procurement or construction phase, will be ready in the near future. There are a few trigeneration units in the tertiary sector, a few sewage and landfill gas installations and some industrial and district heating biomass applications. Due to short winters, CHP is not economically feasible for space heating: trigeneration is necessary for an economic operation.

Governmental estimates for CHP potentials in the services sector vary between 100 and 300 MWe under current support policies for CHP. With the expansion of the natural gas network, SMEs both in industry and services (hotels, hospitals and large office buildings) represent the most promising potential for small scale CHP penetration in Greece. Unfortunately, due to the high price of gas, some units are now at a stand.

Promotion of CHP technology in the industrial and tertiary sector is also one of the key measures in the Second Greek national Climate Change Programme.

Main contractual, technical and administrative requirements

Greece has the lowest domestic electricity prices in the EU-15 (63 EUR/MWh tax excluded), while industrial and commercial sector electricity prices are close to the EU-15 average. CHP prices are linked

purchasing to the PPC end-user prices, which hurt the economics of CHP. However, the situation is improving with the electricity market liberalisation. Special tariffs for cogeneration and gas cooling have recently been applied, although uncertainty regarding the future prices of natural gas is rather high (bilateral contracts with the sole supplier, The Public Gas Corporation – DEPA). Complex licensing and long administrative procedures are -besides the lack of knowledge about the CHP technology- one of the main barriers to further CHP development.

Financial and regulatory support

Investment subsidies are available in the frame the of “Competitiveness” Operational Programme – with up to 35% for new CHP investments (minimum investment 44,000 EUR, required total annual efficiency of 65% for fossil fuelled units) and in the frame of the Development law – 40% of investment, interest or leasing funding or a tax reduction of 100% for private investments in CHP (only hotel units in tertiary sector, paid upon project completion).

Feed in tariffs for CHP

According to the Energy law, n. 2773/99, PPC (TSO) is obliged to purchase all the electricity from Independent Power Producers (IPP) and surplus electricity from auto-producers (AP) at regulated prices expressed in percentages of average PPC tariffs (for energy and power, different voltage levels): 90% energy and 50% power for renewables, 70% energy and 50% power for conventional fuels and 60% energy for AP. The general CHP tariffs are 59.5 EUR/MWh; 57.3 EUR/MWh for electricity from renewables (IPP's, and AP) and 49.1 EUR/MWh for conventional AP.

The latest act concerning production of electricity from renewable energy sources and cogeneration was passed on 27 June 2006 (act n. 3468/2006).

The act sets feed-in tariffs and they are differentiated according to the location of the CHP unit. If the unit is connected to the network system, the feed-in tariff is 73 €/MWh. If the unit is on an island which is not connected to the network system, the feed-in tariff is 84.6 €/MWh. The same feed-in tariffs are applied for biomass power plants. A CHP plant running on biomass cannot combine these tariffs, i.e. they remain the same.

Investment subsidies are available within the framework of the Development Act. They vary, but they can reach 55 % (especially in case of SMEs).

Contacts and useful Web links

- ▶ Hellenic Association for the Cogeneration of Heat and Power (www.hachp.gr), national COGEN Europe member.
- ▶ LDK Consultants, (www.ldk.gr), consulting, (pre) feasibility studies, project management etc.
- ▶ CRES - Centre for Renewable Energy Sources www.cres.gr, renewable CHP (biogas, biomass).
- ▶ COGEN Europe (www.cogeneurope.eu), The European Association for the Promotion of Cogeneration.
- ▶ COGEN Challenge Project (www.cogen-challenge.org), useful tools and documents available.

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