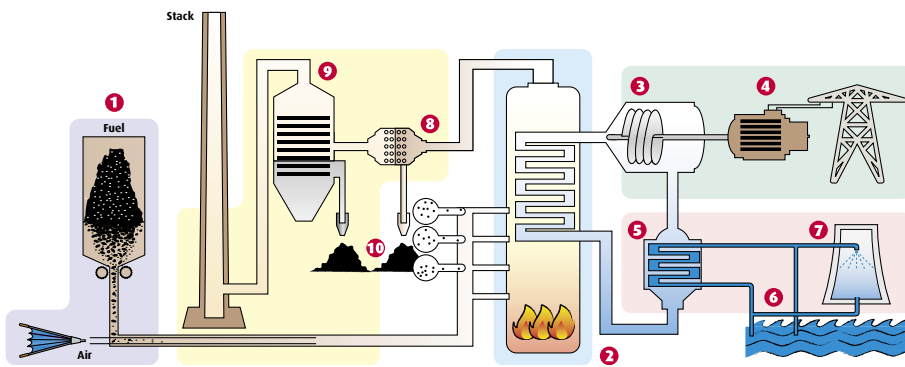




Amer Power Plant

The Amer Power Plant in Geertruidenberg is one of the showpieces of Essent. Electricity and heat are generated in two production units in a clean, safe and environmentally friendly way.

In addition to coal, Essent is increasingly using sustainable sources of energy, such as (clean) biomass. And that results in sustainable energy. The Groene Stroom (Green Power) products for the household market and Groen Zakelijk (sustainable energy for business markets) products for the industrial customers are good examples of this.



- 1 fuel
- 2 boiler
- 3 turbine
- 4 generator
- 5 condenser
- 6 Amer River
- 7 cooling tower
- 8 electrostatic precipitators
- 9 flue gas desulfuration unit
- 10 fly ash and gypsum:
materials for construction

The Amer Power Plant comprises two coal-fired units: unit 8 and unit 9. Together they have a power generating capacity of 1,245 megawatts and a heat production capacity of 600 megawatts. They can produce enough electricity for the power consumption of 3 million households per year.

Electricity and heat

The principle of generating electricity in a power plant is relatively simple. A fuel (in the Amer Power Plant we use coal, natural gas, 'wood gas' and biomass) is used to heat enormous amounts of water in a huge boiler. The steam that is generated then passes through large tubes into a turbine, where it strikes fan-like blades. The blades start spinning and drive the shaft. At the end of the shaft is a generator, which is actually a large magnet that spins around in enormous coils of copper wire. The electricity that is produced inside is then fed into the high-voltage and distribution grid.

Once as much power as possible has been obtained from the steam, it is cooled in the condenser until it is water again, and then channeled back to the boiler. The water from the Amer River is used to cool the steam. The used cooling water, now a bit warmer with added oxygen, then returns to the river. To prevent the river water from becoming too warm, we constantly monitor the temperature of the Amer. If necessary, the cooling tower is used. Both units of the Amer Power Plant are connected to it. The cooling tower has a cooling capacity of 24,000 liters of water per second per unit, is 130 meters high, with a diameter of 110 meters at the base.

Essent also produces heat at the Amer Power Plant. Part of the steam is drawn from the turbine and channeled via a pipe system to homes, businesses,

institutions and market gardening greenhouses.

Unit 8

With a power generating capacity of 645 megawatts and a heat production capacity of 250 megawatts, unit 8 is the second-largest coal-fired combined heat and power plant (CHP) in the Netherlands. The unit has been in use since 1980 and can switch in continuous operation to natural gas or oil and (partly) biomass. The dimensions of the boiler are 17 x 15 x 61 meters. The steam temperature is 540 °C; the steam pressure 178 bar. The stack is 175 meters high. Unit 8 is equipped with electrostatic precipitators. They ensure that almost 100 percent of the fly ash is filtered out of the flue gases. The unit is also equipped with a flue gas desulfuration unit and a DeNO_x-unit, which removes more than 85 percent of the sulfur dioxide (SO₂) and roughly 80 percent of the nitrogen oxides (NO_x) from the flue gases. This system contributes toward reducing the occurrence of acid rain.

Unit 9

With a power generating capacity of 600 megawatts and a heat production capacity of 350 megawatts, unit 9 is the largest coal-fired CHP unit in the Netherlands. The unit consumes a good 1.5 million tons of coal per year, and can also be fired with natural gas and (partly) biomass. The boiler measures 17 x 17 x 74 meters. The steam temperature is 540 °C and the pressure is 270 bar. The stack is 175 meters high. Unit 9 also has electrostatic precipitators and a flue gas desulfuration unit. In order to limit nitrogen oxides (NO_x) emission, the unit has low-NO_x-burners. The specially constructed boiler also reduces NO_x formation.

The removal of ash and sulfur in both units provides raw materials for construction: fly ash, bottom ash and gypsum. So these materials still have a useful purpose.

Biomass: sustainable energy

Also at the Amer Power Plant, Essent is developing a growing number of initiatives aimed at producing sustainable energy and reducing coal utilization. Groene Stroom (Green Power) is produced with clean biomass, and with organic material from garbage, we can make Groen Zakelijk (sustainable energy for business markets). These efforts represent our contribution toward limiting carbon dioxide (CO₂) emissions, while also contributing to the government's climate policy.

Unit 9 also has a wood gasification unit, where 150,000 tons of building timber and salvaged wood can be converted into 'wood gas'. After thorough cleaning it serves as a sustainable fuel, replacing roughly 70,000 tons of coal. The result is a reduction of 170 thousand tons of carbon dioxide (CO₂) per year.

As with the coal, the major part of the sustainable fuels is supplied to the power plant via de River Amer.

Essent

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