

Case | FEDA, Andorra

Andorra: District energy pioneer in southern Europe

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Possibility in every drop



Andorra la Vella, the capital city of Andorra, produces 36 GWh/year of district energy for heating and cooling homes and buildings in the valleys and mountains. This small country is accelerating the green energy transition in southern Europe.

“The collaboration with Grundfos allows us, above all, to optimise our electricity consumption and ultimately to save energy – which is one of FEDA’s priorities”

Nerea Moreno de Salvador,
FEDA’s Director of Communication, Sustainability & Clients

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Andorra has become a front runner in the green energy transition and benchmark in the circular economy in Europe. It produces 36 GWh of thermal energy for its district heating and cooling networks. This helps the country reduce its dependence on fossil fuels and cut electricity use and CO₂, while providing comfort for thousands of customers.

The situation

Andorra is a small country tucked high into the Pyrenees mountains on the Spanish/French border. Around 6-8 million tourists visit every year for winter sports, scenery and shopping. With its deep valleys and high summits, it is also proving to be a front-runner in the green energy transition in southern Europe.

Since the 2010s, the Andorran national energy utility, Forces Eléctriques d’Andorra (FEDA), has been steering the country away from fossil fuels. “We knew this required greater electrification, because electricity is the best way to introduce renewable sources into our energy system,” says Nerea Moreno de Salvador, FEDA’s Director of Communication, Sustainability & Clients.

Because of the steady increase in the number of electric cars, however, there has been a related increase in electricity demand, including spikes in supply, she says. Normally that would mean a huge investment to increase the electricity grid.

“That is why in 2016 we decided to opt for district heating as a more efficient, more sustainable alternative to traditional heating. It also allows us to avoid increasing electricity consumption, including the peaks in demand that are generated in winter when we have the highest demand in our country,” she says.

To build the country’s district energy networks, FEDA created the subsidiary FEDA Ecoterm. Its mission is to reduce the need for electric heating while diversifying domestic electricity production at peak demand times – reducing the country’s energy risk. FEDA’s Head of Thermal Engineering, Hans Urban, explains the simple logic of district energy – a term that encompasses both district heating and cooling. Downtown Andorra la Vella, the country’s capital, has several multi-storey office and apartment buildings. Without district energy, he says, “Every building would have its own chillers, its own heating systems, its own heat pumps and so on.”

With district energy, however, heating and cooling are produced centrally and circulated by pump systems to all the buildings. This brings efficiency. “Electricity demand will be much lower than if each building had individually installed equipment. That is our target. Due to the central production, we can do it much better than individual installations. And by taking over a certain part of Andorra’s electricity demand and moving it to a proper, centralised heating and cooling system, we can control and limit the peak consumption,” says Hans Urban.



FEDA Ecoterm’s supply of insulated pipes for district heating, carrying heated supply water at 90°C out to customers and 60°C return.

The solution

FEDA’s subsidiary, FEDA Ecoterm, develops the district energy solutions. The first was a cogeneration plant producing both heat and power in the ski village of Soldeu in 2016. A pipe network of about 5,800 m (3.6 miles) supplies heating and hot water to local homes, hotels and recreational buildings. In coming years, FEDA Ecoterm plans to convert from gas to renewable biomass to produce the energy, Nerea Moreno de Salvador says. In 2019, the company introduced the Andorra la Vella heat network, which starts at biomass waste treatment centre CTRASA, on the mountainside above the city. Hans Urban says the plant produces about 80% of all the heat for the grid. “The idea of building up a grid here came because we had a lot of heat here, that wasn’t being used,” he says. The facility supplies 30GWh of heat energy a year, preventing the emission of 6,700 tonnes of CO₂. In addition, steam generated by the waste incineration produces 20 GWh/year of electricity.

Another network has also been built just outside the city centre, the Escaldes-Engordany district energy system. This one includes Andorra’s first cooling grid. It uses aerothermal (air-based) energy, as well as cold thermal energy from the river. The atypical installation is built on a bridge and next to the North Valira River. The system extracts the river water, utilises its thermal heat, then returns it to the river at a maximum temperature difference of 1°C for minimal environmental impact, according to Hans Urban. It currently supplies 740 homes, along with

three sets of high-rise buildings.

“Once we built this system, a lot of other clients asked to be connected,” says Hans Urban – including a local hospital. “That is why we needed to make bigger installations, and that is why we will use the river water to help produce the cooling.”

Nerea Moreno de Salvador says that a system like Escaldes-Engordany saves energy while providing year-round comfort.

“Thanks to the collaboration with Grundfos, we have received excellent advice on using the best pumping systems,” she says. “This allows us, above all, to optimise our electricity consumption and ultimately to save energy, which is one of FEDA’s priorities.”

She continues, “District heating, in the end, offers us an alternative to transition traditional heating towards a more efficient heating system – without the need to change the entire installation required for electric heating.”

Hans Urban adds, “The production can be done by different boilers, or biomass – or like at Escaldes, a water-to-water chiller. It allows us to use other kinds of technologies, reducing electricity consumption and CO₂ emissions by changing the system. Having a grid allows you to use any kind of energy you want to install.”



FEDA's Hans Urban and Grundfos's Jordi Caballol inspect the SCADA system controls screen at the pressure breakage substation Serradells above Andorra la Vella.

Changing the rules

Because of the high differences in elevation in Andorra, the system designers needed to think differently. "We must not forget that pumping is the heart," says Jordi Caballol, Technical Manager CBS, Bombas Grundfos España. "When we started to design this installation, we designed it like most of the district heating systems in the world, which use a horizontal axial type pump."

"But Andorra is not like all the other places. Andorra is a valley, and the installations are up the mountain, but also downstream. That's why we had to come together about how we could overcome these challenges with the high pressures in these installations. How could we do it? And we decided, why not use booster pumps?"

And that is what we have done. We have updated the rules of the game, because this country needs these installations."

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Hans Urban says that working with Jordi has been "very easy".

"I have very easy access to Jordi. He has a very quick reply. For us, this is very good and very important. So this is really one of the main factors. The product is good, but the support is better," says Hans Urban. "That's what it's about. You need somebody who gives you the supply and response on your problems and that we get from Grundfos."

"Andorra is not like other places for district heating. How could we overcome these challenges with the high pressures? And we decided, why not use booster pumps."

Jordi Caballol, Technical Manager CBS, Bombas Grundfos España



Grundfos TPE pumps for closed loop circulation at the Escaldes-Engordany heating/cooling production site.



FEDA Ecosterm uses vertical booster pumps from Grundfos to help deal with the high pressures of transferring heated and chilled water in the extreme altitude differences of Andorra.

The outcome

With three district energy networks installed and more on the way, Andorra is already feeling the benefits.

“Thanks to district heating, today we are supplying around 36 GWh of thermal energy throughout the country,” says Nerea Moreno de Salvador. “That means that if all these heating systems had become electric heating systems, today there would be 7% higher electricity demand.”

Hans Urban says moving heating and cooling to district energy has not only helped reduce CO2 emissions and energy demand – but it has allowed the Andorran government to prevent the long-term collapse of its power grid and keep a secure and autonomous energy supply.

“District heating and cooling allows us to use different energy sources

– not just one particular kind,” he says. “In Andorra la Vella we use biomass. In Escaldes we use river water for chilling. It’s a more modern and sustainable combustion plan, allowing us to use other technologies in our grid. Versus not having a grid and individual installations for every building.”

Nerea Moreno de Salvador says, “For us it is a matter of pride to have been able to develop these district heating networks. It is one of the successful projects in the country that FEDA has developed, because with a solution that was unknown until just nine years ago, we have been able to provide a more efficient system for the country. It is a system that contributes to the decarbonisation of Andorra, and that is at the same time a good solution for customers.”



Hans Urban,
Head of Thermal Engineering, FEDA



The Escaldes-Engordany district energy system includes Andorra's first cooling production, which will be helped with free cooling from the adjacent river water.



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Nerea Moreno de Salvador,
FEDA's Director of Communication, Sustainability & Clients

Grundfos supplied

Grundfos has supplied multiple types of pumps and controls for the district energy networks in Andorra, including the following:

- **TPE for closed loop circulation**
- **CR, CRE – individual boosting pump**
- **MAGNA3 for closed loops**
- **SL – submersible cooling installations**
- **MPC multi-pump controls**

Topic
District energy

Location
Andorra

Customer
FEDA, Andorra's national energy company

Sources

The facts in this story come from interviews on site in Andorra la Vella, Andorra, and at various FEDA sites on 10-11 April 2025.

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[Watch Case Story video](#)

Read more about Grundfos solutions for district heating and cooling [here](#).

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