



Green Bond Project (post issue)
ISSUED 2017-MATURITY 2027
(ISIN XS1704789590)

March 2023

Waste to energy plant for Heat Production in Parma

Eligible Category

Energy efficiency (Cogeneration facilities)

Full amount project

227.5 mln

Financed amount

Total 212.1 mln

KPIs

- PES Primary Energy Saving Indicator per operating year [%]
- Renewable energy share in percent on total [%]
- Thermal energy recovered from waste to Parma DH network in MWh per operating year [GWh]

Project description

The waste-to-energy plant (WTE) for municipal and special solid waste in Parma was built between 2009 and 2013, the year in which it entered service. The site, called PAI, located in the Municipality of Parma also provides for the construction of other waste treatment plants, including an urban waste pre-treatment plant.

The waste-to-energy plant, made up of two 35.7 MW combustion lines, can supply a nominal electric power of 22.25 MW and a thermal power of 43.5 MW.

The thermal energy produced is transferred to the city district heating network, to which the plant is directly connected.

Eligible Category

Energy efficiency (Cogeneration facilities)

Full amount project

21.0 mln

Financed amount

Total - mln

KPIs

- PES Primary Energy Saving Indicator per operating year [%]
- Renewable energy share in percent on total [%]
- Thermal energy recovered from waste to Piacenza DH network in MWh per operating year [GWh]

Project description

The project involves the construction of a cogeneration section at the existing solid waste-to-energy plant located in Piacenza.

The current state consists of two combustion lines (input 22.7 MW each) that feed a steam cycle with a 11.6 MW condensing type turbine.

In order to strengthen the urban district heating in the city of Piacenza, the city network is expected to be extended and connected to the existing waste-to-energy plant with its consequent modification in order to recover the thermal energy necessary for heat distribution.

The plant started permanent production and cogeneration in autumn 2021.

Development of separate waste collection services

Eligible Category

Waste management efficiency and recycling (Waste collection and sorting upgrades)

Full amount project

101.0 mln

Financed amount

Total 42.1 mln

KPIs

- Total sorted waste collection [t]
- Total of non sorted waste disposed [t]
- Sorted waste collection [%]

Project description

The project concerns the development of separate waste collection through:

1) TRANSFORMATION OF THE SORTED WASTE COLLECTION SYSTEM

- TORINO: transformation of the separate collection system in Torino with the extension of home collection. The enhancement is realized through traditional internalized door-to-door models, with small-sized containers placed on private property, or through the use of large-sized smart containers placed on the public road, prodromal to the application of the punctual pricing
- EMILIA: Anticipating the regional planning, in the territories of the Emilian municipalities served by Iren, the Group has implemented a progressive transformation of waste collection services from the road model to the door-to-door model, with prodromal methods for the application of punctual pricing. The situation of the interventions is diversified in the 3 provinces

2) COLLECTION HUBS IN THE EMILIA AREA

It is the progressive extension to all collection hubs of a computerized system used for the registration of incoming users and for the control of delivered volumes in order to the application of a discount system. Following the identification by the user, a special device is used to input all the information relating to the contribution operation.

Eligible Category

Energy efficiency (Energy distribution and management)

Full amount project

4.3 mln

Financed amount

Total 3.9 mln

KPIs

- Primary energy saving per operating year [MWh]
- Avoided CO₂ emissions from fossil sources per operating year [t]

Project description

Heat accumulation system inside the thermal integration and reserve plant located in the area known as BIT, in Turin, serving the district heating network of the Turin metropolitan area.

The district heating network is composed of 743 km of double pipes and about 75,5 million m³ of district heating volumes (at December 2022).

The system accumulates and supplies superheated water from the district heating network, with a flow temperature normally between 105° C and 120° C.

The storage system has the function of storing the thermal energy produced by the thermoelectric plants in cogeneration, when the heat demand is less, to sell it in the hours of maximum load of the district heating network, reducing the use of integration boilers.

Eligible Category

Energy efficiency (Energy distribution and management)

Full amount project

11.2 mln

Financed amount

Total 11.2 mln

KPIs

- Primary energy saving per operating year [MWh]
- Avoided CO₂ emissions from fossil sources per operating year [t]

Project description

Heat accumulation system, inside the Martinetto industrial site, in Turin, serving the district heating network of the Turin metropolitan area.

The district heating network is composed of 743 km of double pipes and about 75,5 million m³ of district heating volumes (at December 2022).

The system accumulates and supplies superheated water from the district heating network, with a flow temperature normally between 105° C and 120° C.

The storage system has the function of storing the thermal energy produced by the thermoelectric plants in cogeneration, when the heat demand is less, to sell it in the hours of maximum load of the district heating network, reducing the use of integration boilers.

Eligible Category

Energy efficiency (Energy distribution and management)

Full amount project

12.0 mln

Financed amount

Total 1.9 mln

KPIs

- Primary energy saving per operating year [MWh]
- Electrical energy produced from renewable non-fossil sources per operating year [MWh]
- Thermal energy produced from renewable non-fossil sources per operating year [MWh]
- Avoided CO₂ emissions from fossil sources per operating year [t]

Project description

Heat storage system, in the area of the former Mirafiori Nord plant, in Turin, serving the district heating network of the Turin metropolitan area.

The district heating network is composed of 743 km of double pipes and about 75,5 million m³ of district heating volumes (at December 2022).

The storage system has the function of storing the thermal energy produced by the thermoelectric plants in cogeneration, when the heat demand is less, to sell it in the hours of maximum load of the district heating network, reducing the use of integration boilers.

Inside the site are also present:

- a photovoltaic system with a nominal power of 46 kWp connected to the site's electrical system
- a solar thermal plant with a nominal capacity of 410 kW connected to the district heating system

Eligible Category

Energy efficiency (Energy distribution and management)

Full amount project

7.7 mln

Financed amount

Total - mln

KPIs

- Electrical energy produced from renewable non-fossil sources per operating year [MWh]
- Avoided CO₂ emissions from fossil sources per operating year [t]

Project description

Substation of heat exchange and pumping of the district heating network, called "Lucento", located in the homonymous district of Turin to feed the current 90° C network.

The project consists in the construction of a new heat exchange and pumping substation and the installation of a photovoltaic system with a nominal power of 30 kWp connected to the site's electrical system.

The new configuration of the district heating network of the Vallette district will allow, in particular, to save primary sources and reduce greenhouse gas emissions, thanks also to the contribution of electricity (photovoltaic) produced from renewable sources.

Eligible Category

Energy efficiency (Energy distribution and management)

Full amount project

7.8 mln

Financed amount

Total 2.0 mln

KPIs

- Avoided CO₂ emissions from fossil sources per operating year [t]
- Distributed thermal energy per operating year [MWh]

Project description

The heat exchange and pumping station was built in a newly constructed building inside the Gerbido (TO) waste-to-energy plant owned by TRM and is intended to use the heat produced in the combustion of waste for the district heating service.

In 2020, the TRM waste-to-energy plant was connected, through the heat exchange and pumping station, with the district heating network of the Turin metropolitan area, which also includes the networks of Grugliasco, Beinasco, Rivoli, Collegno, Nichelino and Moncalieri.

Eligible Category

Renewable energy (Energy network development)

Full amount project

15.2 mln

Financed amount

Total 5.7 mln

KPIs

- Avoided CO₂ emissions from fossil sources per operating year [t]
- Distributed thermal energy per operating year [MWh]

Project description

The project consists of laying the pipes of the heat distribution network and creating heat exchange stations for users to increase the volume connected to the district heating service in the city of Piacenza.

The project also provides for the connection of the town district heating network with the waste-to-energy plant in order to use the heat produced by the combustion of waste and simultaneously allow the increase in volume connected to the district heating of about 1,000,000 m³.

The heated volume at 31/12/2022 is equal to 2.254.470 m³, of which 770.000 m³ related to "Tecnoborgo Connection" project.

In 2022, the Sacred Heart University area to the south-east of the city was reached.

Finally, the project involves the construction of the pumping station of the district heating network at the waste-to-energy plant.

Eligible Category

Renewable energy (Energy network development)

Full amount project

29.2 mln

Financed amount

Total 26.0 mln

KPIs

- Primary energy saving per operating year [MWh]
- Avoided CO₂ emissions from fossil sources per operating year [t]
- Distributed thermal energy per operating year [MWh]

Project description

The project consisted of the connection of new users in the city of Parma following the connection of the city network with the waste-to-energy plant (PAI) in operation since December 2013, as envisaged in the authorization documents of the PAI.

The connection with the PAI plant has allowed the increase of production efficiency thanks to the use of cogenerated heat in place of that of the boilers.

The project continues since the year 2017 with the laying of the pipes of the heat distribution network and the construction of heat exchange stations at the utilities to increase the volume connected to the service of district heating.

Over the years, connections have continued, with an increase in heated volume from 5,789,589 m³ to 6,275,820 m³.

Eligible Category

Renewable energy (Energy network development)

Full amount project

174.9 mln

Financed amount

Total 91.0 mln

KPIs

- Primary energy saving per operating year [MWh]
- Avoided CO₂ emissions from fossil sources per operating year [t]
- Distributed thermal energy per operating year [MWh]

Project description

The project consists in laying the pipes of the heat distribution network and creating heat exchange stations for users to increase the volume connected to the district heating service. The development of the project, in the period 2014 - 2022 concerns the following areas:

- Turin DH network saturation: about 1.0 million cubic metres of volume were connected in 2022, reaching the progressive value of 10.7 million cubic metres compared to the project forecast of 8 million
- Extension of the DH Torino Nord network: about 0.37 million cubic metres were connected in 2022, reaching a cumulative value of 2.3 million cubic metres
- Development of the San Salvario area network: in 2022, work continued on the laying of the distribution network and the connections of the utilities in the San Salvario district. In addition, the works for the construction of the storage system were completed and the start-up and operational tests of the system began. The progressive value of 1.2 million cubic metres was reached thanks to the 0.53 million cubic metres connected in 2022.
- Borgata Lesna and Gerbido network development: in 2022, connection activities continued in the Lesna and Gerbido suburbs in Grugliasco, thanks to the acquisition of an important large customer, totalling about 0.3 million cubic metres.
- Network development Grugliasco, Rivoli, Collegno, Beinasco: in 2022, connection activities continued within the municipalities, for a total of 0.07 million cubic metres.

The design and authorisation activities for the Torino Nord Est project continued.

Eligible Category

Renewable energy (Energy network development)

Full amount project

9.8 mln

Financed amount

Total 6.8 mln

KPIs

- Primary energy saving per operating year [MWh]
- Avoided CO₂ emissions from fossil sources per operating year [t]
- Distributed thermal energy per operating year [MWh]

Project description

The project consists in laying the pipes of the heat distribution network and in the creation of heat exchange stations for the users to increase the volume connected to the service.

The estimated increase in heated volume connected to district heating in the period 2012-2022 for the city of Reggio Emilia was approximately 1 Mm³ between 31/12/2011 (approximately 12,670,000 m³) and 31/12/2022 (13,677,214 m³).

Eligible Category

Renewable energy (Mini Hydro Power)

Full amount project

4.3 mln

Financed amount

Total 4.3 mln

KPIs

- Electrical energy produced from renewable non-fossil sources per operating year [MWh]
- Avoided CO₂ emissions from fossil sources per operating year [t]

Project description

The plant, of the flowing water type, is located near the barrier cross on the Po river in the municipality of La Loggia (TO) and uses the release of the minimum vital flow on the leap existing between the reservoir upstream and the Po level downstream cross.

Next to the production plant there is a ladder for the ichthyofauna built with 27 successive tanks and equipped with a visualization and control system (fish counter).

The nominal average power of the plant is equal to 644 kW and an average annual electricity capacity of 3.5 GWh/year.

The plant has been in regular service since February 2014

Eligible Category

Renewable energy (Mini Hydro Power)

Full amount project
0.2 mln

Financed amount	
Total	- mln

KPIs
<ul style="list-style-type: none"> • Electrical energy produced from renewable non-fossil sources per operating year [MWh] • Avoided CO₂ emissions from fossil sources per operating year [t]

Project description

The project involves the construction of a new 1.2 MW hydroelectric plant in the Municipality of Noasca in the province of Turin, which exploits the water of the Orco torrent (this is the reconstruction of the plant that was built in the 1920s to feed the construction site of the Ceresole dam. The plant was decommissioned in the 80s).

The final design was completed and in August 2016 the hydroelectric concession was approved by the Metropolitan City of Turin, while in August 2019 the authorization for the construction and operation of the plant was issued.

Eligible Category

Renewable energy (Mini Hydro Power)

Full amount project

0.04 mln

Financed amount

Total - mln

KPIs

- Electrical energy produced from renewable non-fossil sources per operating year [MWh]
- Avoided CO₂ emissions from fossil sources per operating year [t]

Project description

The project involves the reactivation of a plant discontinued by Enel and acquired through the incorporation of Edipower in the municipality of Giffoni Valle Piana (SA) that uses the water of the Picentino torrent.

The plant, with an installed power of 520 kW and an expected average annual output of 2.3 GWh, is currently in an advanced authorization phase.

Eligible Category

Renewable energy (Solar PV energy generation)

Full amount project

26.7 mln

Financed amount

Total 18.0 mln

KPIs

- Net produced electricity from renewable non-fossil sources per operating year (kWh)
- Avoided CO₂ emissions from fossil sources per operating year (t)

Project description

Enìa Solaris includes 5 photovoltaic plants on the ground in Brindisi (BR), with a total installed capacity of 4.3 MW.

Eligible Category

Waste water treatment (Wastewater treatment plant upgrades)

Full amount project

156.2 mln

Financed amount

Total 37.1 mln

KPIs

- Treated population equivalent (potential) [N]

Project description

The project includes interventions on different plants:

1. revamping of the purification plant in the Municipality of Recco and of the wastewater collecting system from the Municipalities of Camogli, Pieve and Sori;
2. construction of the sea pipeline of the Darsena purifier;
3. construction of the new water treatment plant in the central area of Genoa;
4. adjustment of the treatment plant at the service of the Municipality of S. Margherita Ligure with the construction of a modern membrane system;
5. adjustment of the treatment plant at the service of the Municipality of Rapallo with the construction of a modern membrane system;
6. rationalization of the purification system in Chiavari and Ramaia;
7. new purification plant at the service of the capital and some neighbouring fractions of the Municipality of Torriglia.

Improvement of Reggio Emilia plants

Eligible Category

Waste water treatment (Wastewater treatment plant upgrades)

Full amount project

11.7 mln

Financed amount

Total 10.4 mln

KPIs

- Volumes of water destined to irrigation re-usage / Volumes of total treated water [%]
- Treated population equivalent (potential) [N]

Project description

The project includes interventions on different plants:

1. construction of the advanced tertiary treatment of wastewater leaving the Mancasale treatment plant to obtain an effluent with qualitative requisites to allow its irrigation reuse;
2. upgrading of the Meletole plant;
3. construction of a new purification plant for the municipality of Cadelbosco di Sopra in an area adjacent to the existing plant whose biological sector may in the future be restructured and converted into a rainwater treatment plant;
4. expansion of the Boretto plant;
5. construction of a new water treatment line in addition to the existing line to increase its purification capacity (Canolo plant in Correggio);
6. adjustment of the treatment for the San Bernardino agglomeration through the construction of a purification plant with biological treatment with biodisk.

Eligible Category

Waste water treatment (Wastewater treatment plant upgrades)

Full amount project

6.9 mln

Financed amount

Total 6.1 mln

KPIs

- Treated population equivalent (potential) [N]

Project description

The project includes interventions on different plants:

1. Castel San Giovanni purification plant: upgrading and/or rebuilding all the purification sectors and installation of an MBR compartment for the final filtration of wastewater, the construction of a new transformer substation, the complete reconstruction of the electrical system, the conversion of final separators to tanks for sludge storage;
2. construction of a new waste water treatment plant in the municipality of Calendasco to replace Imhoff pits;
3. reconstruction of the wastewater treatment plant at the service of the Valconasso locality, no longer able to cope with the flow rates arriving at the treatment.

Eligible Category

Waste water treatment (Wastewater treatment plant upgrades)

Full amount project

4.6 mln

Financed amount

Total 2.6 mln

KPIs

- Treated population equivalent (potential) [N]

Project description

The project includes interventions on different plants:

1. Monchio purifier: replacement of two imhoff pits (I level) with a last generation MBR plant
2. Vestola purifier: replacement of an imhoff pit (I level) with a biodisk (II level) plant. Lot 1 is finished. To complete the Lot 2, it needs to installate a second Biodisk for doubling of capacity
3. complete revamping of the purification plant located in the Municipality of Sorbolo (PR)

Eligible Category

Energy efficiency (Cogeneration facilities)

Full amount project

3.0 mln

Financed amount

Total 1.4 mln

KPIs

- Net produced electricity from renewable non-fossil sources per operating year [kWh]
- Avoided CO₂ emissions from fossil sources per operating year [t]

Project description

Cogeneration turboexpansion plant for the exploitation of the pressure drop between the national and city gas distribution networks in the methane arrival cabin of Genoa Gavette. Combined electricity production (1 MW power production) and heat.

Eligible Category

Renewable energy (Mini Hydro Power)

Full amount project

9.2 mln

Financed amount

Total 9.2 mln

KPIs

- Net produced electricity from renewable non-fossil sources per operating year (kWh)
- Avoided CO₂ emissions from fossil sources per operating year (t)

Project description

The project includes interventions on different plants:

1. Mignanego: replacement of turbine and generator with new production group and increase of installed power of about 450 kW;
2. Busalla: new production group for the exploitation of the flows coming from the Busallegto lake;
3. Isoverde: replacement of turbogenerators and power boards in MV and automation of MV / MV and MV / LV transformers;
4. Lavezze: replacement of turbogenerators and power boards, installation of new MV / LV transformation;
5. Campomorone: new 400 kW hydroelectric production unit for the exploitation of waterworks leaps;
6. Lavagnina: replacement of hydroelectric production groups and installation of a third group with an increase in installed power from 3 MVA to 3.2 MVA;
7. Central Campi: installation of a 80 kW hydroelectric production unit on waterworks between distribution networks;
8. Baking tray: replacement of the two turbine groups and generators and panel replacement of automation and remote control.