Green Bond Project (post issue) ISSUED 2018-MATURITY 2025 (ISIN XS1881533563)

February 2019

Revamping Saliceti Plant owned by ReCos company (WDF recovery)

1 WASTE MANAGEMENT BU

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

Re/finan	ced amount
2008-2018: 2019:	7.3 mln
2019:	- mln
Total	7.3 mln

KPIs

- Waste-derived fuel (WDF) per operating year [t]
- Percentage of WDF on total treated waste per operating year [%]

Project description

The plant is reserved for the treatment of unsorted, non-dangerous urban waste for transformation into fuel to be used in the production of alternative energy.

The plant was subject to revamping, leading to positive environmental effects.

The WDF production cycle entails mechanical-biological type processes which do not involve the use of heat or chemical substances and/or preparations. The process is sub-divided into 3 phases:

Phase 1: receipt of the unsorted waste

Eligible Category

Full amount project

(2008-2019)

7.3 mln

Phase 2: Biostabilisation of the waste

Phase 3: WDF refining and production.

As regards the incoming quantities of urban waste, the plant makes it possible to:

• transform a significant portion of urban waste into WDF to be used in energy production plants;

• select a portion of urban waste (about 3%) to be earmarked for recovery;

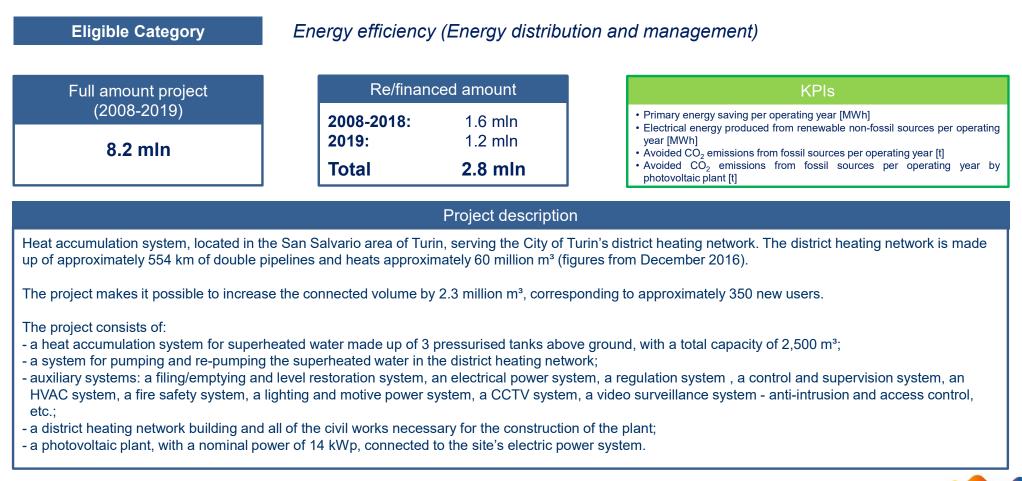
• reduce the quantities of outgoing waste compared to incoming waste, due to the biostabilisation process, which entails evaporating the wet components.

The applied technology is bio-oxidation in biocells and WDF production and has a capacity of 85,000 tonnes/year



Accumulators district heating in San Salvario (TO)

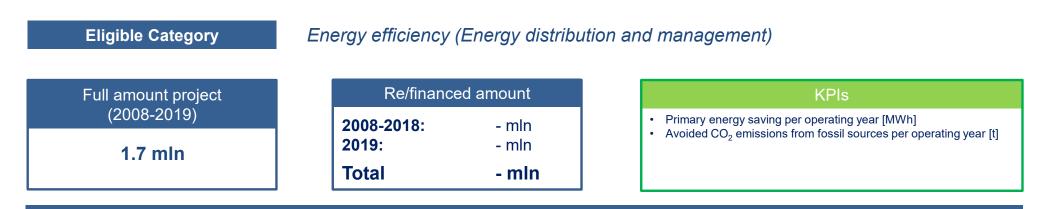
2 ENERGY BU





Accumulators district heating in Piacenza (PC)

3 ENERGY BU



Project description

Heat accumulation system serving the Piacenza district heating network. The Piacenza district heating network is fed by a flow of vapour produced by the Levante cogeneration plant, owned by A2A, and the supplementary and reserve plant on via Diete di Roncaglia, owned by IREN Energia. Both plants are located north-east of the city's district heating network, beyond the rail intersection, and the heat produced is transported to the city. The Piacenza district heating network is made up of 22 km of double pipeline, with a connected volume of approximately 1.6 million m³ as at 31/12/2016.

The project consists of installing a heat accumulation system made up of 3 accumulators, with an overall capacity of 1,200 m³, in the northern part of the city of Piacenza.

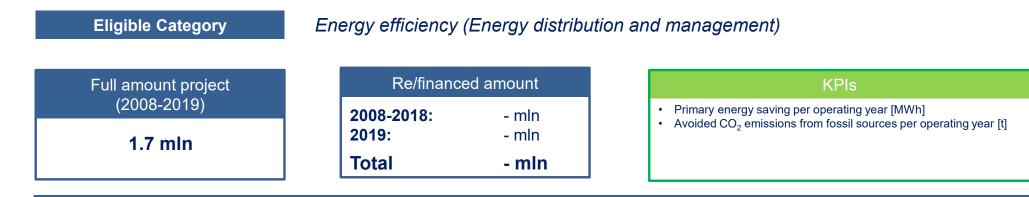
The function of this system is to store the thermal energy produced by the cogeneration thermal power plants, when heat demand is lower, in order to transfer it later, when the district heating network is operating with its maximum load, thus reducing the use of supplementary boilers.

The energy contributed by the accumulation system makes it possible to achieve objectives such as increased operating flexibility and commissioning speed, increased flexibility in managing thermal energy flows, saving primary sources and reducing greenhouse gases.



Accumulators district heating in Parma (PR)

4 ENERGY BU



Project description

Heat accumulation system serving the Parma district heating network. The Parma district heating network is made up of 98 km of double pipeline, with a connected volume of approximately 5.8 million m³ as at 31/12/2016. It is powered by thermal energy generated by the following three plants:

- the Environmental Integrated Centre (EIC), made up of a cogeneration vapour-cycle heat recovery section, fed by two waste-to-energy lines and one supplementary section with boilers and natural gas;
- the Plant on Via Lazio, made up of five supplementary and reserve boilers powered by natural gas;
- the Plant on Strada Santa Margherita, made up of two supplementary and reserve boilers, powered by natural gas and a 500 m³ accumulation system.

The new accumulator system being planned has a volume of 1,200 m³ and will be installed at the Via Lazio plant. The function of this system is to store the thermal energy produced by the EIC's waste-to-energy cogeneration system thermal power plants when heat demand from the district heating network is lower, in order to transfer it later, when the district heating network has its maximum demand for thermal load, thus reducing the use of supplementary boilers.

The energy contributed by the accumulation system makes it possible to achieve objectives such as increased operating flexibility and commissioning speed, increased flexibility in managing thermal energy flows, saving primary sources and reducing greenhouse gases.



Accumulators district heating in Reggio Emilia (RE)

5 ENERGY BU



(2008-2019)

2.2 mln

Re/finance	d amount
2008-2018: 2019:	- mln - mln
Total	- mln

KPIs

- Primary energy saving per operating year [MWh]
- Avoided CO_2 emissions from fossil sources per operating year [t]

Project description

Energy efficiency (Energy distribution and management)

Heat accumulation system serving the Reggio Emilia district heating network. This network is made up of approximately 219 km of double pipelines and heats approximately 13.3 million m³ (figures from December 2016).

The Reggio Emilia district heating network is fed by a cogeneration section and supplementary and reserve boilers in the north-east area of the network (Energy Hub), the supplementary and reserve boilers in the south-west (Network 1 Plant), south-east (Pappagnocca Plant) and north-east (Via Sardegna Plant) areas of the network.

A 1,600 m³ accumulation system is already installed in the Reggio Emilia district heating network at the Energy Hub, with a daily loading/unloading operation during the heating season.

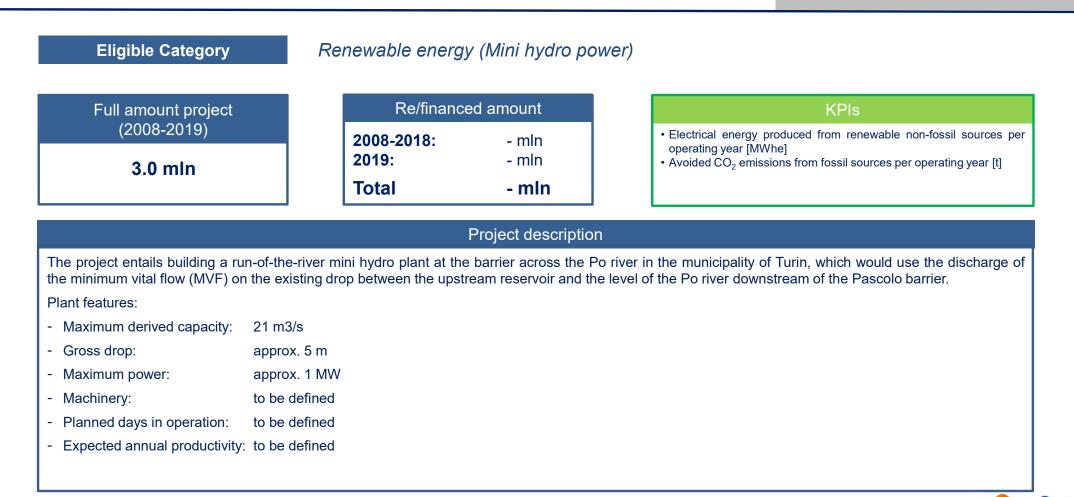
The new accumulator system being planned has a volume of 1,200 m³ and will be installed at the Via Sardegna Plant. The function of the accumulation system is to store the thermal energy produced by the cogeneration thermal power plants when heat demand is lower, in order to transfer it later, when the district heating network is operating with its maximum load, thus reducing the use of supplementary boilers.

The energy contributed by the accumulation system makes it possible to achieve objectives such as increased operating flexibility and commissioning speed, increased flexibility in managing thermal energy flows, saving primary sources and reducing greenhouse gases.



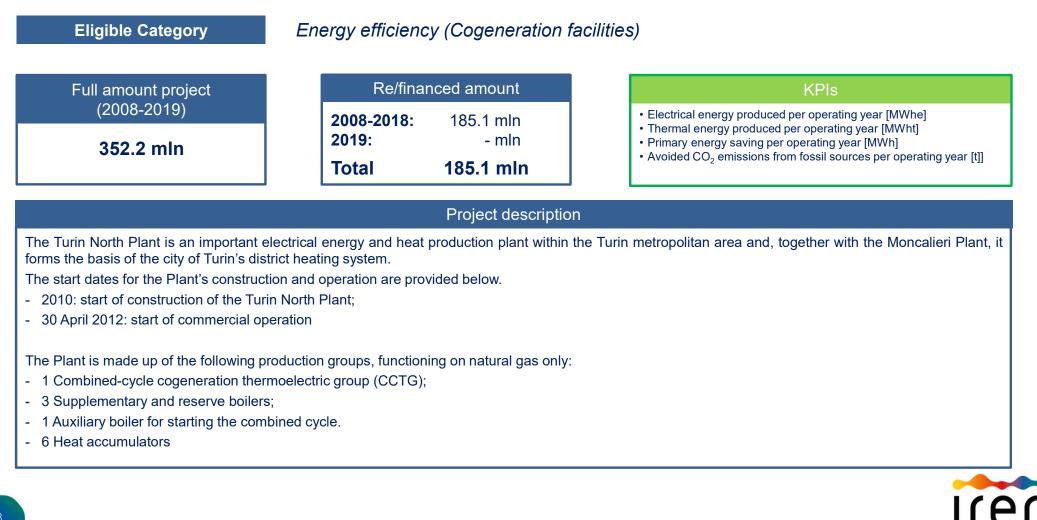
San Mauro/Diga del Pascolo Mini Hydro plant

6 ENERGY BU



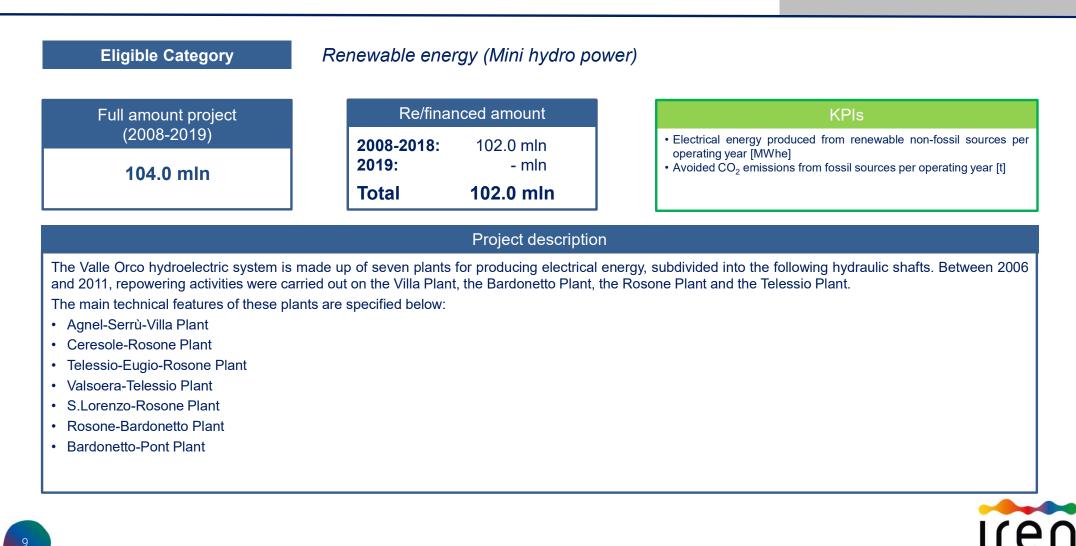


Cogeneration plant Torino Nord



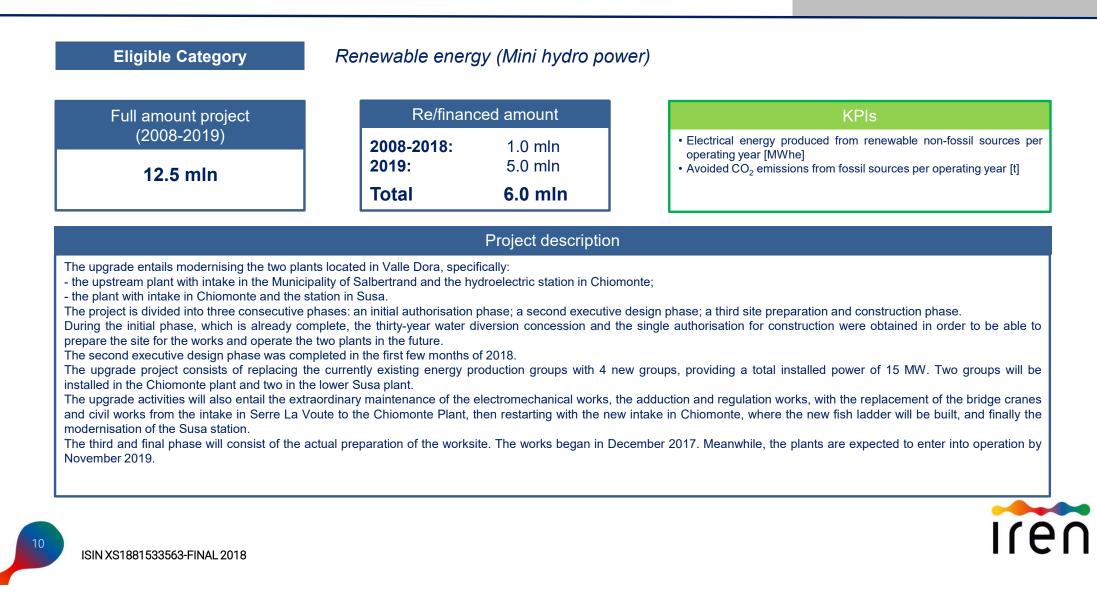
Valle Orco hydroelectric plants

8 ENERGY BU



VDE hydroelectric plant (Chiomonte-Susa) repowering project

9 ENERGY BU



Cogeneration plant Moncalieri–GT2 RPW

Full amount project	Re/financed amount	KPIs
(2008-2019)	2008-2018: 18.6 mln	 Electrical energy produced per operating year [MWhe] Thermal energy produced per operating year [MWht]
161.2 mln	2019: - mln	 Primary energy saving per operating year [MWh] Avoided CO₂ emissions from fossil sources per operating year [t]]
	Total 18.6 mln	
	Project descripti	
entional combustion vapour generator (CSG) wi	(called RPW 2GT) was built from a pre-existing plant for th hich fed a condensation vapour turbine.	ON e conventional-cycle production of electrical and thermal energy (2GT) and made up of a
entional combustion vapour generator (CSG) wh project consisted of converting the conventional second closed-cycle thermoelectric group is ma	(called RPW 2GT) was built from a pre-existing plant for th hich fed a condensation vapour turbine. -cycle 2GT into the combined-cycle RPW 2GT. de up of:	e conventional-cycle production of electrical and thermal energy (2GT) and made up of a
entional combustion vapour generator (CSG) wh project consisted of converting the conventional second closed-cycle thermoelectric group is mare electric-powered gas turbine of approximately 2 eat RVG, with chimney, into which the gases dis electric-powered condensation vapour turbine of	(called RPW 2GT) was built from a pre-existing plant for th hich fed a condensation vapour turbine. -cycle 2GT into the combined-cycle RPW 2GT. de up of: 60 MW, powered by methane gas, with an air-cooled electric ge scharged from the gas turbine are piped; of approximately 138 MW, with the related air-cooled electric ge	e conventional-cycle production of electrical and thermal energy (2GT) and made up of a
entional combustion vapour generator (CSG) wh project consisted of converting the conventional second closed-cycle thermoelectric group is mare electric-powered gas turbine of approximately 2 eat RVG, with chimney, into which the gases dis electric-powered condensation vapour turbine of ating system, complete with a vapour bypass system ondensation system for the vapour turbine, usin	(called RPW 2GT) was built from a pre-existing plant for the nich fed a condensation vapour turbine. -cycle 2GT into the combined-cycle RPW 2GT. de up of: 60 MW, powered by methane gas, with an air-cooled electric ge scharged from the gas turbine are piped; of approximately 138 MW, with the related air-cooled electric ge stem; g cooling water taken from the diversion channel;	e conventional-cycle production of electrical and thermal energy (2GT) and made up of a nerator; erator, with low-pressure vapour intake for the production of superheated water for the distric
entional combustion vapour generator (CSG) whoroject consisted of converting the conventional second closed-cycle thermoelectric group is mare electric-powered gas turbine of approximately 2 eat RVG, with chimney, into which the gases diselectric-powered condensation vapour turbine of ating system, complete with a vapour bypass system of exchangers for producing heat for the disas decompression and fiscal measurement stati	(called RPW 2GT) was built from a pre-existing plant for the nich fed a condensation vapour turbine. -cycle 2GT into the combined-cycle RPW 2GT. de up of: 60 MW, powered by methane gas, with an air-cooled electric ge scharged from the gas turbine are piped; of approximately 138 MW, with the related air-cooled electric ge stem; g cooling water taken from the diversion channel; strict heating system, using the low-pressure vapour taken from ion.	e conventional-cycle production of electrical and thermal energy (2GT) and made up of a merator; erator, with low-pressure vapour intake for the production of superheated water for the distric the vapour turbine;
entional combustion vapour generator (CSG) whoroject consisted of converting the conventional second closed-cycle thermoelectric group is mare electric-powered gas turbine of approximately 2 eat RVG, with chimney, into which the gases dis electric-powered condensation vapour turbine of ating system, complete with a vapour bypass system of exchangers for producing heat for the dis as decompression and fiscal measurement statt single-camshaft and single-body gas turbine (Grischarge gas collector;	(called RPW 2GT) was built from a pre-existing plant for the hich fed a condensation vapour turbine. -cycle 2GT into the combined-cycle RPW 2GT. de up of: 60 MW, powered by methane gas, with an air-cooled electric ge scharged from the gas turbine are piped; of approximately 138 MW, with the related air-cooled electric ge stem; g cooling water taken from the diversion channel; strict heating system, using the low-pressure vapour taken from	e conventional-cycle production of electrical and thermal energy (2GT) and made up of a merator; erator, with low-pressure vapour intake for the production of superheated water for the distric the vapour turbine;
entional combustion vapour generator (CSG) whoroject consisted of converting the conventional second closed-cycle thermoelectric group is mare electric-powered gas turbine of approximately 2 eat RVG, with chimney, into which the gases diselectric-powered condensation vapour turbine of ating system, complete with a vapour bypass system of exchangers for producing heat for the disas decompression and fiscal measurement statisingle-cambaft and single-body gas turbine (G	(called RPW 2GT) was built from a pre-existing plant for the hich fed a condensation vapour turbine. -cycle 2GT into the combined-cycle RPW 2GT. de up of: 60 MW, powered by methane gas, with an air-cooled electric ge scharged from the gas turbine are piped; of approximately 138 MW, with the related air-cooled electric ge stem; g cooling water taken from the diversion channel; strict heating system, using the low-pressure vapour taken from ion. T) in use, which has a multistage axial compressor and a multis	e conventional-cycle production of electrical and thermal energy (2GT) and made up of a merator; erator, with low-pressure vapour intake for the production of superheated water for the distric the vapour turbine;

Mini Hydro Fornace plant in Baiso (RE)

11 **ENERGY BU**

Full amount project	Re/financed a	amount	KPIs
(2008-2019) 7.4 mln	2019:	3.8 mln - mln 3.8 mln	 Net produced electricity from renewable non-fossil sources per operating year [kWh] Avoided CO₂ emissions from fossil sources per operating year [t]
	Pro	roject description	
	ant was built on the Secchia river	ər, along the stretch tł	hat lies within the municipality of Baiso, in the province of Reggio
a run-of-the-river plant, built with	n particular attention to the minim	-	hat lies within the municipality of Baiso, in the province of Reggio nmental impact, in terms of altering the landscape profile and in
ilia.	n particular attention to the minim	-	
ilia. a run-of-the-river plant, built with racting with the micro ecosystem o	n particular attention to the minim	-	

Photovoltaic plants owned by "Varsi" company

12 ENERGY BU

Full amount project	Re/finan	ced amount			KPls			
(2008-2019)	2008-2017:	16.8 mln	•	Net produced electricit	y from renewa	able non-fossil	sources per	
	2018-2019:	- mln		 operating year [kWh] Avoided CO₂ emissions from fossil sources per operating year [t] 				
27.5 mln				Avolueu CO ₂ emission	5 110111 105511 5	ources per op	erating year [
	Total	16.8 mln						
		Project descriptior	•					
/arsi Eotovoltaico encompasses 12 r	nhotovoltaic plants: 8 on	PI	ant	Municipality	Province	Power (KWP)	Туре	
		PI Gonzaga Fiera	ant	Municipality Gonzaga	Province Mantua	Power (KWP) 741	Type Roof	
						741		
		Gonzaga Fiera	o (Bocce hall)	Gonzaga	Mantua	741	Roof	
		Gonzaga Fiera Gonzaga Bocciodromo	o (Bocce hall) ol	Gonzaga Gonzaga	Mantua Mantua	741 43 64	Roof Roof	
		Gonzaga Fiera Gonzaga Bocciodromo Gonzaga middle scho	o (Bocce hall) ol	Gonzaga Gonzaga Gonzaga	Mantua Mantua Mantua	741 43 64	Roof Roof Roof	
		Gonzaga Fiera Gonzaga Bocciodromo Gonzaga middle scho Rigosa PTV [photovolt	o (Bocce hall) ol aic plant]	Gonzaga Gonzaga Gonzaga Roccabianca	Mantua Mantua Mantua Parma	741 43 64 890	Roof Roof Roof Ground	
/arsi Fotovoltaico encompasses 12 p he ground and 4 on roofs, with an ove		Gonzaga Fiera Gonzaga Bocciodromo Gonzaga middle scho Rigosa PTV [photovolt Canesio PTV	o (Bocce hall) ol aic plant]	Gonzaga Gonzaga Gonzaga Roccabianca Pellegrino P.se	Mantua Mantua Mantua Parma Parma	741 43 64 890 551	Roof Roof Roof Ground Ground	
		Gonzaga Fiera Gonzaga Bocciodromo Gonzaga middle scho Rigosa PTV [photovolt Canesio PTV Bellario, road to Sorag	o (Bocce hall) ol aic plant] na PTV	Gonzaga Gonzaga Gonzaga Roccabianca Pellegrino P.se San Secondo P.se	Mantua Mantua Mantua Parma Parma Parma	741 43 64 890 551 998 998	Roof Roof Roof Ground Ground Ground	
		Gonzaga Fiera Gonzaga Bocciodromo Gonzaga middle schoo Rigosa PTV [photovolt Canesio PTV Bellario, road to Sorag Rimale PTV	o (Bocce hall) ol aic plant] na PTV	Gonzaga Gonzaga Gonzaga Roccabianca Pellegrino P.se San Secondo P.se Fidenza	Mantua Mantua Mantua Parma Parma Parma Parma	741 43 64 890 551 998 998	Roof Roof Ground Ground Ground Ground	
		Gonzaga Fiera Gonzaga Bocciodromo Gonzaga middle scho Rigosa PTV [photovolt Canesio PTV Bellario, road to Sorag Rimale PTV Italian Isolating Plants Priorato PTV Busseto Fotovoltaico S	o (Bocce hall) ol raic plant] ina PTV SRL	Gonzaga Gonzaga Gonzaga Roccabianca Pellegrino P.se San Secondo P.se Fidenza Porto Torres Fontanellato Busseto	Mantua Mantua Mantua Parma Parma Parma Parma Sassari Parma Parma	741 43 64 890 551 998 998 998 972 995 432	Roof Roof Ground Ground Ground Ground Roof Ground Ground Ground	
		Gonzaga Fiera Gonzaga Bocciodromo Gonzaga middle scho Rigosa PTV [photovolt Canesio PTV Bellario, road to Sorag Rimale PTV Italian Isolating Plants Priorato PTV	o (Bocce hall) ol raic plant] ina PTV SRL o SRL	Gonzaga Gonzaga Gonzaga Roccabianca Pellegrino P.se San Secondo P.se Fidenza Porto Torres Fontanellato	Mantua Mantua Mantua Parma Parma Parma Parma Sassari Parma	741 43 64 890 551 998 998 998 972 995 432 832	Roof Roof Ground Ground Ground Ground Roof Ground	



Photovoltaic plants owned by "Greensource" company **Eligible Category** Renewable energy (Solar PV energy generation) Re/financed amount Full amount project **KPIs** (2008-2019)• Net produced electricity from renewable non-fossil sources per 2008-2017: 7.6 mln operating year [kWh] 2018-2019: - mln • Avoided CO₂ emissions from fossil sources per operating year [t] 16.8 mln Total 7.6 mln **Project description** PTV Green Source encompasses various Municipality Power (KWP) Plant Province Туре photovoltaic plants, with an overall power of 3.9 MW C8 Reggio Emilia Reggio Emilia 1.212 Roof Tennis Club Reggio Emilia Reggio Emilia 200 Roof Pluris Energy Castellarano Reggio Emilia 710 Ground **ITIS Parma** Parma Reggio Emilia 170 Ground Mancasale Reggio Emilia 993 Roof Reggio Emilia Scandiano Reggio Emilia Scandiano indoor sports arena 95 Roof Castellarano Reggio Emilia 122 Tressano School Facilities Reggio Emilia-Parma-Piacenza Reggio Emilia-Parma-Piacenza 357 Roof Total 3.859 Iren

ENERGY BU

13

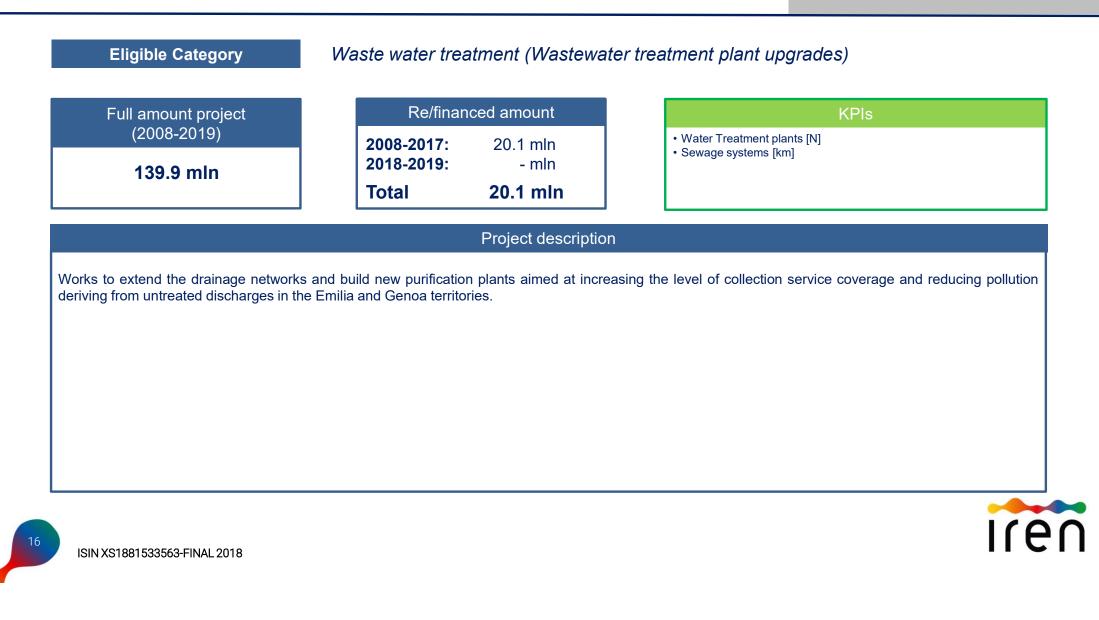
E-mobility initiatives in the Iren offices

14 MARKET BU

Full amount project	Re/financed amount	KPIs
(2008-2019) 10.4 mln	2008-2017:0.9 mln2018-2019:9.5 mlnTotal10.4 mln	- Avoided CO_2 emissions from fossil sources per operating year
	Project descri	ption
replacing 100% of the current heat-	-powered quadricycles and obsolete cars, plan	most of which are currently in operation in Turin) with new vehicles ned to take place within the 2018-2023 plan.
replacing 100% of the current heatGroup vehicle replacement: approxInstallation of infrastructure: installi	nt: replacing the current electric quadricycles (-powered quadricycles and obsolete cars, plan kimately 400 vehicles from all of the company's	most of which are currently in operation in Turin) with new vehicles ned to take place within the 2018-2023 plan. main sites (cars used for short distances and small vans) boxes for charging vehicles at the various sites distributed throughou

Investiments in Sewage and Waste water plants (Emilia and Liguria)

15 NETWORKS BU



Electricity distribution investments

16 NETWORKS BU

