Green Bond Project (post issue)
ISSUED 2020-MATURITY 2031
(ISIN XS2275029085)

March 2023

I.Blu: Selection plant in San Giorgio di Nogaro (UD)

Eligible Category

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

Full amount project	Financed amount		KPIs
7.7 mln	Total	7.0 mln	• Plastic sent for material recovery [t] • Avoided CO_2 emissions [t]

Project description

The plant, owned by Iblu, a company controlled by Iren Ambiente, carries out the treatment and selection of plastic packaging waste mainly on behalf of the Consortia PRO (Producers Responsibililty Organizations) on the basis of a multi-year contract.
The process consists of the following steps:

- acceptance, verification and start-up of selection, by loading the bag opener-doser machine;
- highly automated primary selections (dimensional and ballistic separations)
- selection of flexible packaging (mainly polyethylene film), through an aeraulic separation;
- separation of the steel and aluminum through a series of magnets and eddy current devices;
- subdivision of the hollow objects (flacons, bottles, etc) by polymer and color through a series of optical detection devices (infrared) and compressed air nozzles;
- manual quality control for the various fractions (including flexible ones);
- the various products are then sent to temporary storage bunker, pending the subsequent volumetric reduction.

The plant's current production capacity is 120,000 t/y.

In April 2023, a variant of 165,000 t/y according to R3 (Recycling/Recovery) was authorised for 130,000 t/y and 120,000 t/y according to R12 (Other treatment, including R3). This authorisation increases management flexibility and obviously the two input data do not add up arithmetically.

ISIN XS2275029085

I.Blu: Selection plant in Cadelbosco (RE)

Eligible Category	*Waste management efficiency and recycling (Waste collection and sorting upgrades)*

Full amount project	Financed amount		KPIs
10.5 mln	Total	7.7 mln	• Plastic sent for material recovery [t] • Avoided CO_2 emissions [t]

Project description

The plant, owned by Iblu, a company controlled by Iren Ambiente, carries out the treatment and selection of plastic packaging waste mainly on behalf of the Consortia PRO (Producers Responsibililty Organizations) on the basis of a multi-year contract.
The process consists of the following steps:

- acceptance, verification and start-up of selection, by loading the bag opener-doser machine;
- highly automated primary selections (dimensional and ballistic separations)
- selection of flexible packaging (mainly polyethylene film), through an aeraulic separation;
- subdivision of the hollow objects (flacons, bottles, etc) by polymer and color through a series of optical detection devices (infrared) and compressed air nozzles;
- manual quality control for the various fractions (including flexible ones);
- the various products are then sent to temporary storage bunker, pending the subsequent volumetric reduction.

The plant's current production capacity is 110,000 t/y.

ISIN XS2275029085

I.Blu: Recycling plant in Costa di Rovigo (RO)

Eligible Category *Waste management efficiency and recycling (Waste collection and sorting upgrades)*

Full amount project	Financed amount		KPIs
12.3 mln	Total	9.2 mln	• Blupolymer produced [t] • Bluair produced [t] • Avoided CO_2 emissions [t]

Project description

The plant, owned by IBLU, also operates on behalf of the Corepla Consortium and consists of two distinct production lines.

a) **Washing and granulation line (Line 1)**: this line deals with a previously selected waste consisting of mixed polyolefins.
After a first primary trituration step, the polyolefin component is separated from the other fractions. The polyolefin fraction is then centrifuged and "squeezed" by mechanical presses that reduce its humidity and densified using twin-screw extruders at high temperatures. After the cooling and grinding phases, the densified product is finally sent to single-screw extruders which transform it into granules (Blupolymer) used for:
- create products for the construction of low energy impact buildings and outdoor spaces that respect the environment;
- increase the strength and durability of the asphalt over time, ensuring intact flooring for longer, reduced maintenance and greater safety, less waste of resources and circularity of materials.

b) **Production line of Bluair reducing agent (Line 2)**: the incoming waste, consisting of more heterogeneous and less refined plastic, is subjected to primary shredding, then densified, shredded with a blade mill and separated into different sizes with the aid of a rotating screen. In the process, the heavy fraction of Line 1 processing is also reused, reducing the amount of waste produced by the plant. At the end of the process the product is stored in heaps and shipped mainly in bulk. The output product is Bluair reducing agent (secondary reducing agent, S.R.A.) intended for the steel industry.

The plant's current production capacity is approximately 42,000 t/y.
Following the concession of the authorisation, which is expected to be valid from 2024, the authorised capacity of the plant will be 60,000 t/y.

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I.Blu: Recycling plant in San Giorgio di Nogaro (UD)

Eligible Category	*Waste management efficiency and recycling (Waste collection and sorting upgrades)*

Full amount project	Financed amount		KPIs
19.7 mln	Total	7.8 mln	• Bluair produced [t] • Avoided CO_2 emissions [t]

Project description

The planned plant, owned by Iblu, is in operation since the second quarter of 2021 and will also operate on behalf of the Corepla Consortium.

The incoming waste, consisting of more heterogeneous and less refined plastic, is subjected to primary shredding, then densified, shredded with a blade mill and separated into different sizes with the aid of a rotating screen. At the end of the process the product is stored in heaps and shipped mainly in bulk. The output product is Bluair reducing agent (secondary reducing agent, S.R.A.) intended for the steel industry.

The authorized production capacity is 90,000 t / y, divided into five distinct lines that can be achieved with partial testing and deferred timing.

In April 2023, a variant of 165,000 t/y according to R3 (Recycling/Recovery) was authorised for 130,000 t/y and 120,000 t/y according to R12 (Other treatment, including R3). This authorisation increases management flexibility and obviously the two input data do NOT add up arithmetically.

ISIN XS2275029085

Development of separate waste collection services

Eligible Category	*Waste management efficiency and recycling (Waste collection and sorting upgrades)*

Full amount project	Financed amount	KPIs
101.0 mln	Total 16.8 mln	• 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.

ISIN XS2275029085

Biowaste recovery to produce compost and biomethane - Ferrania (SV)

Eligible Category *Waste management efficiency and recycling (Waste collection and sorting upgrades)*

Full amount project	Financed amount	
25.5 mln	Total	9.3 mln

KPIs

- Production of compost (% on organic fraction in input) [%]
- Production of biomethane [Msm^3]
- Avoided CO_2 emissions from fossil sources per operating year [t]
- Primary energy saving per operating year [Toe]

Project description

The second of July 2019, Iren Ambiente acquired the whole property of FERRANIA ECOLOGIA, owner of an existing plant. The total cost of the acquisition is around 8.8 million Euros.
The plant actually treats 30,000 t/y of bio-waste municipal waste which are turned into compost.
In 2018, the local authority approved to increase the total amount of waste from 30,000 t/y to 60,000 t/y, to which 20,000 t/y of compostable waste are added for a total of 80,000 t/y . In meantime approved the production of Biomethane,

The aim of the project is the construction of a bio-waste treatment plant exploiting the organic and green waste collected in the Liguria region, in particular in the provinces of Savona and Genoa, and for remaining part the bio-waste available on the market.
The proposed plant falls into the category of projects identified in Annex IV, Part Two of Legislative Decree 152/2006.

The Biomethane is produced in accord to the incentivisation law of the biofuel and biomethane, D.M. 2.3.2018.

The plant started commercial operation in July 2021

ISIN XS2275029085

Parma district heating network

Eligible Category	*Renewable energy (Energy network development)*

Full amount project	Financed amount	KPIs
29.2 mln	Total 2.5 mln	• Primary energy saving per operating year [MWh] • Avoided CO_2 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 from 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 m^3 to 6,275,820 m^3.

ISIN XS2275029085

District heating networks development in Reggio Emilia

Eligible Category	*Renewable energy (Energy network development)*

Full amount project	Financed amount	KPIs
9.8 mln	Total 2.4 mln	• Primary energy saving per operating year [MWh] • Avoided CO_2 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 Mm^3 between 31/12/2011 (approximately 12,670,000 m^3) and 31/12/2022 (13,677,214 m^3).

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Cogeneration plant Torino Nord

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Ref.: Project 7-ISIN XS1881533563
Ref.: Project 6-ISIN XS2065601937

Eligible Category	*Energy efficiency (Cogeneration facilities)*

Full amount project	Financed amount	KPIs
351.9 mln	Total 98.4 mln	• Electrical energy produced per operating year [MWhe] • Thermal energy produced per operating year [MWht] • Primary energy saving per operating year [MWh] • Avoided CO_2 emissions from fossil sources per operating year [t]

Project description

The Turin North Plant is an important electrical energy and heat production plant within the Turin metropolitan area and, together with the Moncalieri Plant, it forms the basis of the district heating system in the Turin metropolitan area.

The start dates for the Plant's construction and operation are provided below.
- 2010: start of construction of the Turin North Plant;
- 30 April 2012: start of commercial operation

The Plant is made up of the following production groups, functioning on natural gas only:
- 1 Combined-cycle cogeneration thermoelectric group (CCTG);
- 3 Supplementary and reserve boilers;
- 1 Auxiliary boiler for starting the combined cycle.
- 6 Heat accumulators
- 1 Electrical energy storage system

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Torino LED (I and II phases)

Eligible Category

Energy efficiency (Energy distribution and management)

Full amount project	Financed amount		KPIs
22.1 mln	Total	4.6 mln	• Primary energy saving per operating year [MWh] • Avoided CO_2 emissions from fossil sources per operating year [t]

Project description

Since 1986, Turin's public lighting service is operated by the Iren Group: the installations consist of approximately 98,500 lighting points, the total luminous flux is 1,530 million lumens. The electricity grid extension is over 2,800 km, the total electrical power is 11.118 MW. The project consisted of two phases. Phase 1, started in 2015 and ended in 2017, led to the replacement of approximately 54,000 public lighting points, or 54% of the city's lighting fixtures, with LED lights, with important benefits on the economic and environmental front; its main objectives were to achieve significant energy and economic savings, as well as important benefits on the environmental front. Phase 2, called 'Light Changes the City', was the natural continuation of the TO LED 1 project initiated in 2015 with the City of Turin. In the second phase of the project, work was carried out on the lighting fixtures of the city's main subpass and high-power lighting fixtures (formerly 400 W lamps). The project included the replacement of around 900 high-powered lighting devices and 6,000 lighting devices in the city's subpass (Bramante, Lingotto, Mortara, Oddone, Repubblica, Rivoli, Spezia).

The efficiency and reliability of the new LED lighting, in addition to night dimming, ensured a reduction of approximately 64% in the electricity consumption of the public lighting installations affected by the intervention.

The new LED lights installed in the public lighting systems emit a pleasant white light (neutral white or warm white, depending on the urban context of use) and also have greater control in the emission of the luminous flux, directed only to the area to be illuminated: they guarantee greater luminous coverage of the streets, increasing the perception of safety for the citizens who cross them and reducing light pollution at night. Phase 3 of the Torino LED Project is currently being evaluated and will involve the remaining lighting fixtures (historical, street furniture, globes, light towers, street lighting for series installations).

ISIN XS2275029085

Smart solutions

Eligible Category *Energy efficiency (Energy distribution and management)*

Full amount project	Financed amount	KPIs
46.3 mln	Total 26.0 mln	• Avoided CO_2 emissions from fossil sources per operating year [t] • Primary energy saving per operating year [Toe]

Project description

The energy efficiency project produces positive impacts in terms of reducing electricity and thermal consumption, thanks to the activities developed in 3 areas of intervention:

1) **Public lighting Municipality of Fidenza:** redevelopment and energy efficiency interventions of the city's public lighting system with the replacement of 6,174 lighting fixtures with new LED technology fixtures; refurbishment of switchboards; implementation of remote control on switchboards and in the luminaires in the city centre; smart city interventions: digital screens to promote events, city access points, wi-fi, etc;
2) **Technological renewal of thermal power stations of municipal buildings in Turin**: energy pre-intervention redevelopment diagnoses and Energy Performance Certificates; installation of high efficiency boilers in 224 municipal buildings; EPC contracts to guarantee efficiency gains.
3) **Interventions to improve the energy efficiency of technological systems**
   - **Teatro Regio**: replacement of 10 AHU fan motors; centralized cooling and heat recovery with the installation of 4 latest-generation refrigeration units and replacement of the cooling towers. installation of an energy recovery system consisting of a heat pump for heat recovery from tower water; redevelopment of the water plant by installing two new boilers served by two newly installed exchangers; thermal power plant requalification; installation of 6 condensing thermal groups of 840 kW; building management system with the implementation of a new automation system of the BACS type. Thermal power plant requalification of the **Scenography Warehouse Strada Settimo**: installation of 2 condensing thermal groups of 900 kW
   - **Municipality of Grugliasco**: insulation of the opaque building envelope; replacement of windows and doors; installation of a new heat recovery building air conditioning system; installation of an energy supervision system; local re-lamping (replacement of existing lamps with LED technology elements); installation of a new photovoltaic system.

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Enìa Solaris photovoltaic plants near Brindisi

Eligible Category	*Renewable energy (Solar PV energy generation)*

Full amount project	Financed amount		KPIs
26.7 mln	Total	8.6 mln	• Net produced electricity from renewable non-fossil sources per operating year [kWh] • Avoided CO_2 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.

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Photovoltaic plants owned by “Varsi” company

Eligible Category

Renewable energy (Solar PV energy generation)

Full amount project	Financed amount	
27.5 mln	Total	10.7 mln

KPIs

- Net produced electricity from renewable non-fossil sources per operating year [kWh]
- Avoided CO_2 emissions from fossil sources per operating year [t]

Project description

Varsi Fotovoltaico encompasses 12 photovoltaic plants: 8 on the ground and 4 on roofs, with an overall power of 8.4 MWh.

Plant	Municipality	Province	Power (KWP)	Type
Gonzaga Fiera	Gonzaga	Mantua	741	Roof
Gonzaga Bocciodromo (Bocce hall)	Gonzaga	Mantua	43	Roof
Gonzaga middle school	Gonzaga	Mantua	64	Roof
Rigosa PTV [photovoltaic plant]	Roccabianca	Parma	890	Ground
Canesio PTV	Pellegrino P.se	Parma	551	Ground
Bellario, road to Soragna PTV	San Secondo P.se	Parma	998	Ground
Rimale PTV	Fidenza	Parma	998	Ground
Italian Isolating Plants	Porto Torres	Sassari	972	Roof
Priorato PTV	Fontanellato	Parma	995	Ground
Busseto Fotovoltaico SRL	Busseto	Parma	432	Ground
Medesano Fotovoltaico SRL	Medesano	Parma	832	Ground
Villora PTV (Municipality of Varsi)	Varsi	Parma	851	Ground
Total			**8,367**	

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Photovoltaic plants owned by “Greensource” company

Eligible Category

Renewable energy (Solar PV energy generation)

Full amount project	Financed amount		KPIs
16.8 mln	Total	9.2 mln	• Net produced electricity from renewable non-fossil sources per operating year [kWh] • Avoided CO_2 emissions from fossil sources per operating year [t]

Project description

Green Source PTV encompasses various photovoltaic plants, with an overall power of 3.9 MW.

Plant	Municipality	Province	Power (KWP)	Type
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	Reggio Emilia	993	Roof
Scandiano indoor sports arena	Scandiano	Reggio Emilia	95	Roof
Tressano	Castellarano	Reggio Emilia	122	
School Facilities	Reggio Emilia-Parma-Piacenza	Reggio Emilia-Parma-Piacenza	357	Roof
Total			**3.859**	

ISIN XS2275029085

Improvement of Reggio Emilia plants

Eligible Category	*Waste water treatment (Wastewater treatment plant upgrades)*

Full amount project	Financed amount	Kéls
11.7 mln	Total 1.2 mln	• 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.

ISIN XS2275029085

Improvement of Piacenza plants

Eligible Category	*Waste water treatment (Wastewater treatment plant upgrades)*

Full amount project	Financed amount	KPIs
6.9 mln	Total 0.8 mln	• 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.

ISIN XS2275029085

Investments in drainage and purification (La Spezia - Liguria)

Eligible Category	*Waste water treatment (Wastewater treatment plant upgrades)*

Full amount project	Financed amount		KPIs
53.8 mln	Total	6.3 mln	• Treated population equivalent (potential) [N]

Project description

The project aims to extend the drainage networks and build new purification plants aimed at increasing the level of collection service coverage and reducing pollution deriving from untreated discharges in the La Spezia territory.

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Electricity distribution Smart Metering 1G+2G (Torino and Parma)

Eligible Category	*Energy efficiency (Energy distribution and management)*

Full amount project	Financed amount	KPIs
59.5 mln	Total 1.1 mln	• 1G Smart meters installed [1] [n] • 2G Smart meters installed [n] • Percentuage of smart meters on the total [%]

Project description

IRETI is the company of the Iren Group that manages the electrical energy distribution and metering services in the cities of Turin and Parma, providing electricity to more than 720.000 supply points (PODs - Points of Delivery), approx. 570.000 of which located in Turin and approx. 150.000 in Parma.

Promoted by Resolution no. 292/06 and extended by Resolution no. 87/16 of ARERA (Authority for Regulation of Energy, Networks and Environment), the present project consisted in the replacement of the traditional electromechanical meters with a new generation of meters (smart meters), enabled for both the functions of remote reading and remote management. Such metering system allows collecting a much higher amount of measurement data, guaranteeing the billing of due payments based on the actual values of their electricity consumption, and simplifying several activities such as the activation/deactivation of a supply contract, the increase/decrease of the committed power capacity, as well as the service transfer or switching procedures, based on the actual measurement data.

Both a greater availability of reliable measurements (the smart meter allows energy consumption to be recorded) and an increasing ability to attribute the hourly cost of energy to the customer's actual consumption profile help to make the end customer more aware of the effects of their consumption style (ref. Directive 2012/27/EU), favouring virtuous behaviour aimed at a reduction in energy consumption, a better use of the energy commodity with consequent benefits also in environmental terms.

For instance, a pilot project promoted by ARERA (Del. ARG/elt n. 39/10) showed that the availability of a larger amount of actual measures, achieved through the installation of the smart meters, contributed to increase the end users awareness of their consumptions, resulting in an average energy saving of approx. 7%

[1] The project to install 1G smart meters ended in 2020 and the project to gradually replace 1G smart meters with next-generation 2G smart meters has begun.

ISIN XS2275029085

Gas distribution Smart Metering (Emilia and Liguria)

Eligible Category	*Energy efficiency (Energy distribution and management)*

Full amount project	Financed amount	KPIs
110.3 mln	Total 8.0 mln	• Smart meters installed [n] • Percentage of smart meters on the total [%]

Project description

IRETI GAS is the company of Iren Group that manages the gas distribution and metering services in several north western cities of Italy (for example Genoa, Reggio Emilia, Parma), providing gas to more than 780.000 supply points (PDRs or Points of Delivery).

Promoted by Del. n. 575/2012 of ARERA (Authority for Regulation of Energy, Networks and Environment), the present project consists in the replacement of the traditional mechanical meters with a new generation of meters (smart meters), enabled for both the functions of remote reading and remote management. Such metering system allows collecting a much higher amount of measurement data, guaranteeing the billing of due payments based on the actual values of their gas consumption, and improving the management of payment delay, as well as the service transfer or switching procedures, based on the actual measurement data, as well as remotely deactivate the supply due to customer arrears.

A greater availability of real measures provides to the end users a higher awareness of their own gas consumptions (see Directive 2012/27/EU), supporting virtuous behaviours which lead to an energy consumption reduction, with consequent environmental benefits.

Another related environmental effect is the reduction of measurement data collected “in the field” by operators, with a reduction in consumption of fossil fuels and related CO_2 and other harmful emissions.

ISIN XS2275029085

Replacement of gas distribution networks

Eligible Category	*Energy efficiency (Energy distribution and management)*

Full amount project	Financed amount	KPIs
316.4 mln	Total 59.3 mln	• Average network leaks (underground network measured with planned inspection) [n]

Project description

Network maintenance and replacement in Emilia and Liguria: it is a continuous project developed by IRETI that consists in replacing and doing systematic maintenance of the gas distribution network's lines in order to improve the qualitative and technical levels of the network structure. Through the project it will be possible to:

- Avoid greenhouse gas emissions, in particular CH_4;
- Diminish the number of vehicles used for operative activities (such as P.I.);
- Mitigate the excavations made in order to repair the distribution pipelines.
- Improve the quality and continuity of the service, as required by ARERA [the Italian Regulatory Authority for Electricity Gas and Water];
- Improve the safety of the grid;
- Make the grid hydrogen ready.

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