enel X

CIRCULAR ECONOMY

Factbook 2020

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INTRODUCTION

This is the first edition of the **Circular Economy Factbook**, a document covering all **Enel X's initiatives, projects and innovations** in the field of the Circular Economy. Throughout 2020, Enel X has consolidated its efforts both to adopt **Circular Economy** principles as competitive and innovative drivers in the global market, as well as to become an accelerator and enabler of circularity for all its suppliers, customers and partners.

To achieve this goal, Enel X **created a dedicated team** within its Sustainability Team in charge of leading this journey towards a circular ecosystem.

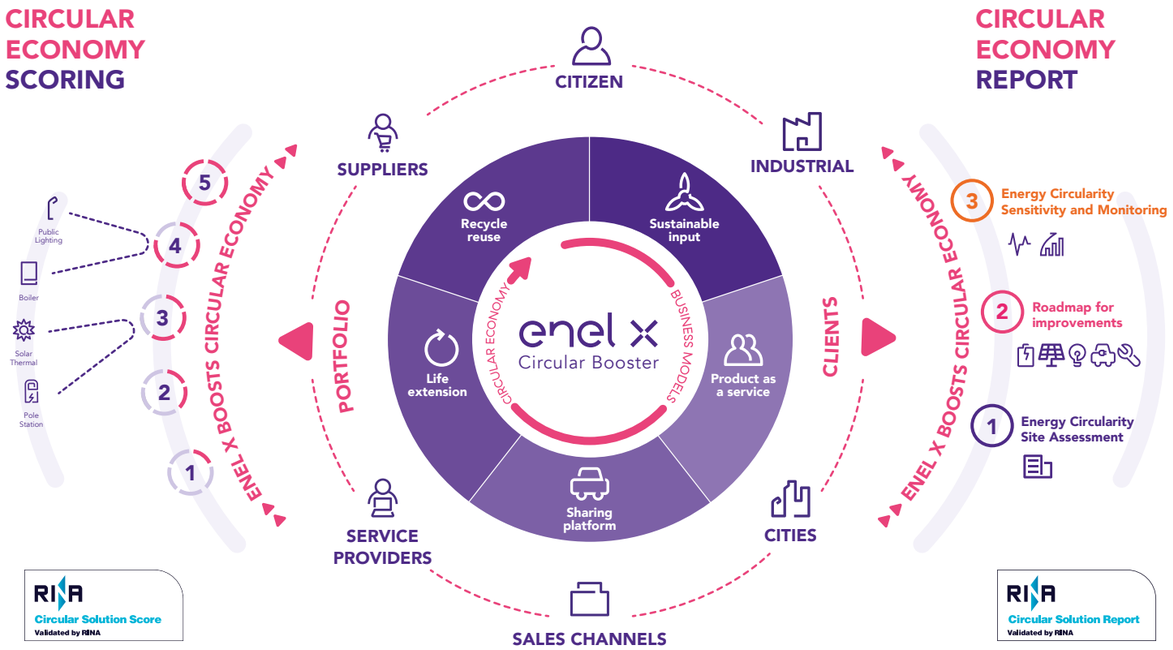
In the following sections, we will describe to you what the Circular Economy means to Enel X and we will explain all the methods, tools and initiatives that have been designed and implemented over the last year.

Hopefully, this is just the beginning.

1

ENEL X'S APPROACH TO THE CIRCULAR ECONOMY

Taking inspiration from the **five Circular Economy business models** (CE), Enel X's ambition is to become an accelerator of **Circular Economy principles** and **sustainable innovation** within its ecosystem of customers, product suppliers, service providers and strategic partners. Thus, we have defined the **Enel X Circular Economy Boosting Program**, a new approach to assess and increase the level of our solutions portfolio and our clients' Circular Economy maturity, by identifying new technologies, business models and innovations to be applied and integrated within portfolios, projects and processes.



What is the Circular Economy?

Using renewable energy sources and materials, extending the lifespan of products, creating sharing platforms, reusing and regenerating products or components, rethinking products as service: these are all elements of the Circular Economy, a **new economic model** developed to address sustainability, while offering businesses extraordinary **competitiveness** and **innovation** and creating value for both companies and their customers. At Enel X, we define the Circular Economy through five pillars: sustainable inputs, product-as-a-service, sharing platforms, product life extension and recovery & recycling.

*World Economic Forum www.weforum.org

Sustainable inputs*

The use of **renewable energy** and **raw materials** that are **renewable**, **recyclable** or **biodegradable** in consecutive lifecycles.

Product-as-a-service*

A new vision of the concept of ownership whereby the producer retains ownership of the product but **offers it to customers** to use in the form of a service.

Sharing platforms*

Promoting the use of platforms where users and owners of goods can collaborate, thereby helping consumers **save money** and **use resources as efficiently as possible**.

Life cycle extension*

Design and production developed with the specifically aiming to **lengthen product lifecycles** which allows companies to repair upgrade and regenerate their products, thereby preventing materials and energy from being wasted.

Recycle & reuse*

The use of new production cycles in which **waste is not eliminated but recovered**, recycled or refurbished for reuse.

1.1

ENEL X'S CIRCULAR ECONOMY BOOSTING PROGRAM

1 **SCORING** – Measuring and assessing as-is circularity levels is fundamental to implementing solutions that lead to circular improvement. To measure the circularity of Enel X's solutions, a Circular Economy Score has been developed, leveraging and integrating **Enel's CirculAbility© Model**. As for clients' circularity, two brand-new scoring models were developed by the Sustainability team, the **Circular Economy Report for private clients** and the **Circular Economy Report for Public Administrations**. Once the perimeter of the solution or client in question has been defined, Enel X starts collecting all the data required to calculate the client's circularity.

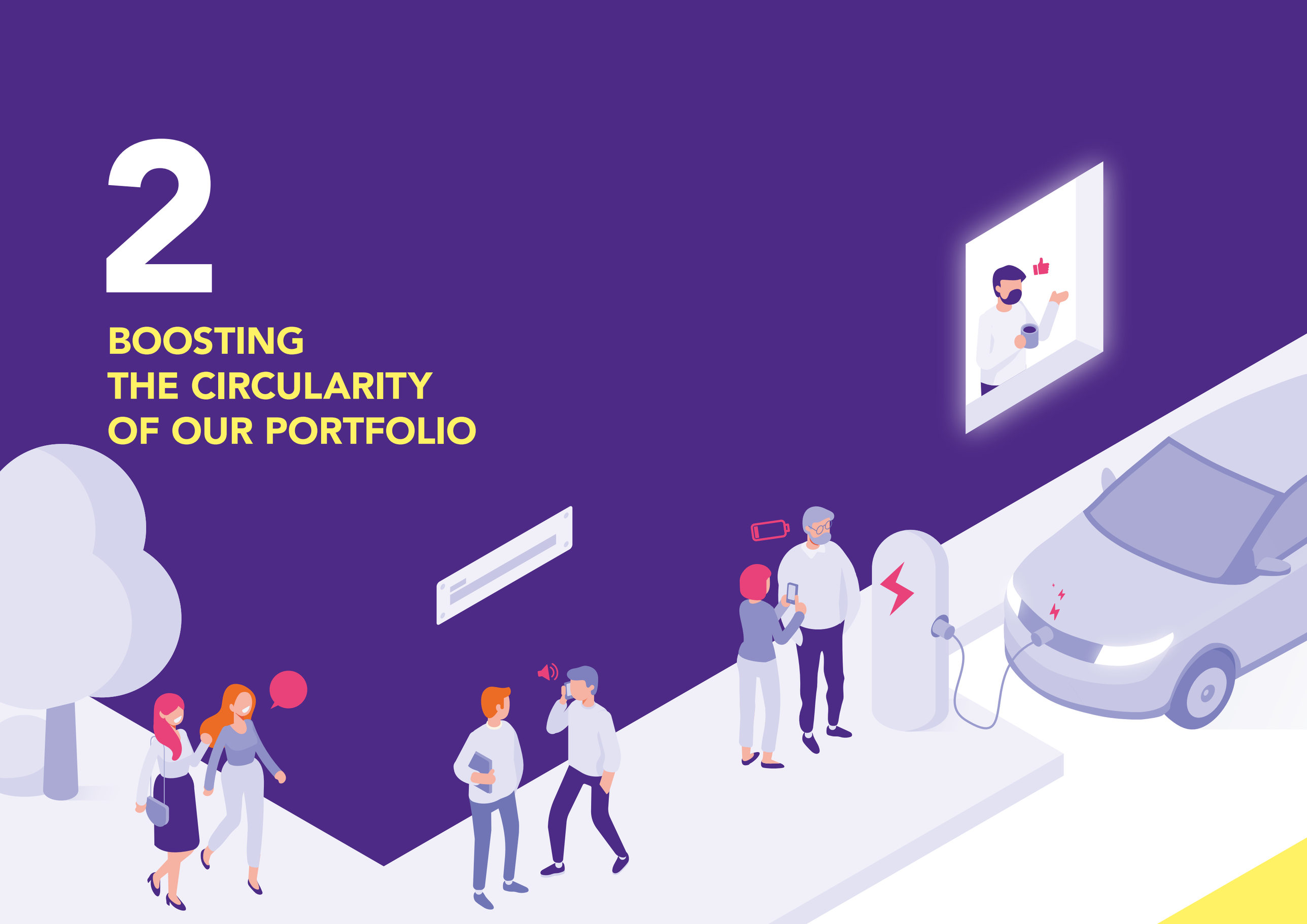
2 **BOOSTING** – Once the data collection process has been activated, the boosting phase can finally begin. As for Enel X's own portfolio, the Sustainable Product Development team works with technical experts from specific Business Lines and countries to get technical insights into the physical product and related commercial offering. This step helps us reconstruct the entire **value chain of the solution in question** and **properly handle start-up actions and innovation scouting** with the support of **Enel's Innovability**. The output of this phase is a set of ideas and opportunities to be discussed with technical experts, in order to select or review only those technologies and business models that meet Enel X's minimum technical and commercial feasibility criteria. As for Enel X's clients, both the Circular Economy Client Report and the Circular Public Administration Report identify key areas for improvement and define a structured roadmap with ad-hoc energy solutions to boost circularity.

3 **IMPLEMENTING** – The circular solutions that are deemed to be feasible and of interest to the business are presented and discussed with the Head of the Business Line, who decides which ones will be developed and commercialized. Most of the energy solutions recommended in the Circular Economy Client Report and/or the Circular Public Administration Report are part of Enel X's solution portfolio, thus customized technical and commercial proposals can be made upon the customer's request.

4 **RE-SCORING** – To close the loop, a new **Circular Economy Score** is calculated to measure **the circular improvement of each boosted solution**. As for clients, both reports provide a sneak peak of the potential circularity increase that they could achieve by implementing some of the suggested energy solutions. However, to measure actual improvement, Enel X's clients should conduct this assessment on a yearly basis.

2

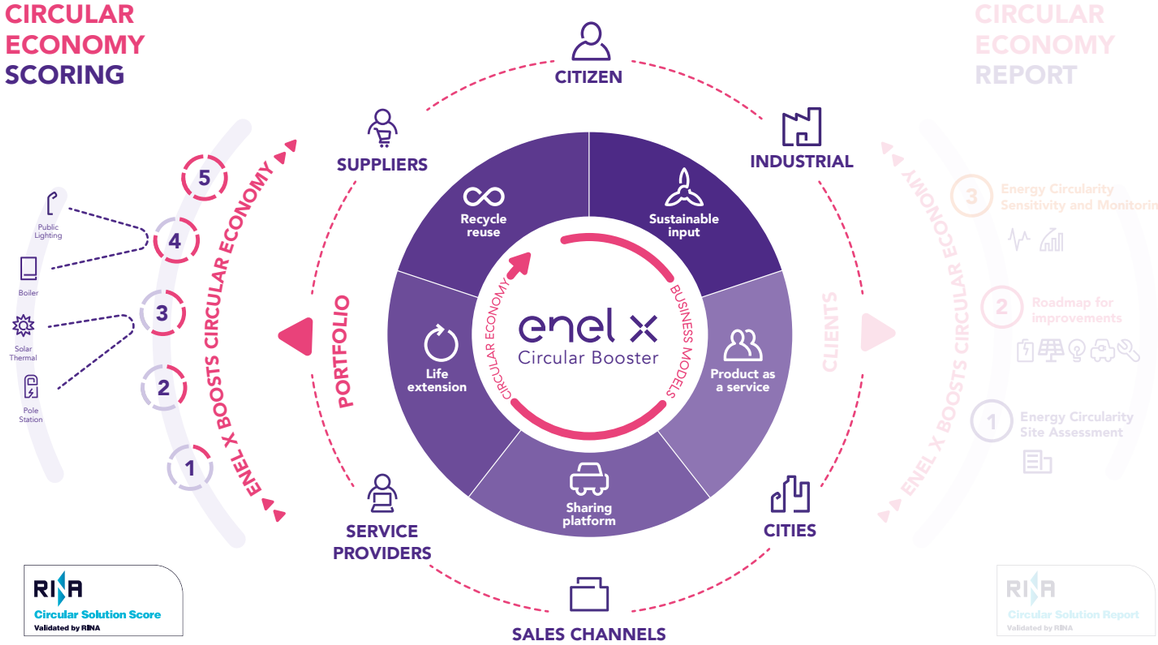
BOOSTING THE CIRCULARITY OF OUR PORTFOLIO



Now that you have been introduced to Enel X's overall approach to the Circular Economy, the following sections will guide you through the **specific tools** and **processes** implemented to boost solutions in our portfolio and our clients' circular maturity.

Let's start with how we score and boost the circularity of our solutions.

CIRCULAR ECONOMY SCORING



CIRCULAR ECONOMY REPORT

2.1

THE CIRCULAR ECONOMY SCORE

By measuring the circularity level of our solutions, the Circular Economy Score represents the starting point for our Boosting Program.

Currently the scoring framework is based on **Enel's CirculAbility® Model**. Furthermore, Enel X is working with prestigious technical and academic partners to improve the model and establish a new LCA (LifeCycle Assessment) based methodology focused on the Circular Economy.

The final output of the **Circular Economy Score** is a value ranging between 0% and 100%, with 100% being the maximum level of circularity achievable. To better prioritize solutions to be boosted and to keep track of significant circular improvements, we have defined a circularity scale ranging from **level 1** to **level 5** as shown below:

CIRCULAR ECONOMY SCORE 1

Level 1
Range 0-20

The solution includes components of limited relevance to the Circular Economy.

CIRCULAR ECONOMY SCORE 2

Level 2
Range 20-40

The solution is characterized by partial use of renewable materials and an elementary incorporation of the Circular Economy principles into the service.

CIRCULAR ECONOMY SCORE 3

Level 3
Range 40-60

The solution also ensures a more sustainable approach in the product consumption and recovery phases; Circular Economy principles partially characterize the way the service is provided.

CIRCULAR ECONOMY SCORE 4

Level 4
Range 60-80

The solution ensures almost all the raw materials used in the production process are totally renewable, while the principles of the Circular Economy are incorporated into the way the service is provided.

CIRCULAR ECONOMY SCORE 5

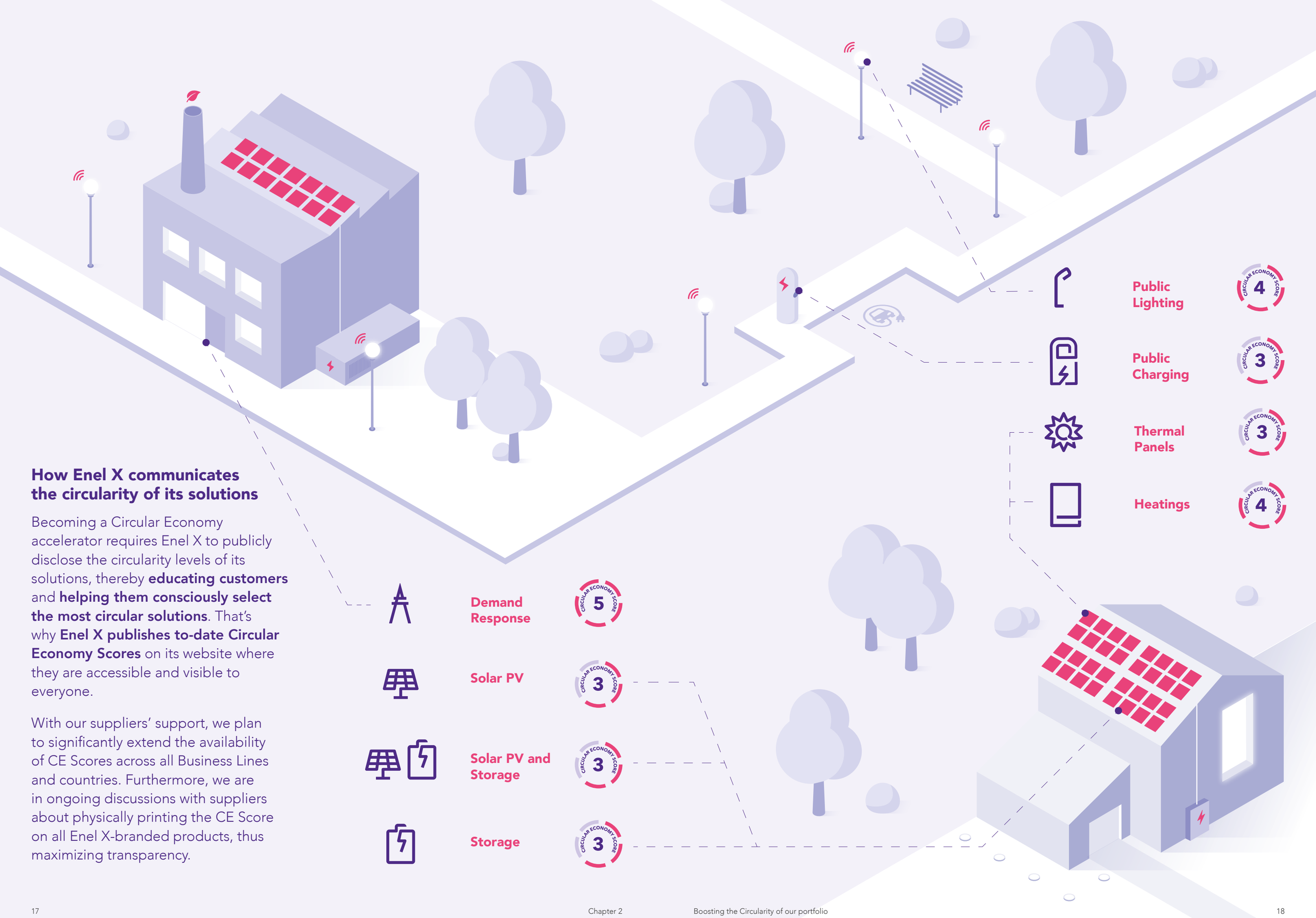
Level 5
Range 80-100

The solution is characterized by products and services that contain high standards and quantities of circularity as defined by the principles of the Circular Economy.

How Enel X communicates the circularity of its solutions

Becoming a Circular Economy accelerator requires Enel X to publicly disclose the circularity levels of its solutions, thereby **educating customers** and **helping them consciously select the most circular solutions**. That's why **Enel X publishes to-date Circular Economy Scores** on its website where they are accessible and visible to everyone.

With our suppliers' support, we plan to significantly extend the availability of CE Scores across all Business Lines and countries. Furthermore, we are in ongoing discussions with suppliers about physically printing the CE Score on all Enel X-branded products, thus maximizing transparency.



e-Industries

Demand Response

Enel X provides commercial and industrial consumers with an innovative service that gives them access to Flexibility Markets. The service modulates the customer's energy consumption in response to peaks in power supply and demand. This enhances grid flexibility and stability, providing potential financial yield to customers.
The Demand Response service provided by Enel X fulfills 2 of the 5 Circular Economy business models:

- **Sustainable Inputs** – Manages the unpredictability and intermittence of renewable energy, thus increasing integration and making the network reliable and flexible.
- **Sharing Platform** – Demand Response allows to regulate energy demand instead of supply, so customers can share their reserve capacity and make it available to the network.

Circular Economy Score
The circularity level of Demand Response services varies from one country to the next and from one customer to the next, so no universal score is applicable. Once a customer activates the DR programs, the score can be calculated with indicators that take these variables into account. Potentially, Demand Response can reach a maximum score of 5.

e-City

Public Lighting

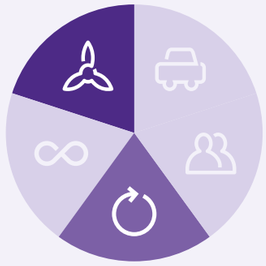
Applying Circular Economy models, Enel X designs and manufactures a wide range of solutions for cities to enhance sustainability and innovation. Enel X's Public Lighting solutions fulfill 3 of the 5 Circular Economy business models:

- **Sustainable Inputs** – Use of materials and technologies that deliver higher efficiency and energy savings compared to the old incandescent and halogen lighting, saving between 70% and 90% in energy output.
- **Sharing Platform** – Using the same asset for various functions, from surveillance cameras to charging infrastructures
- **Product as a Service** – As the service provider, Enel X offers the products for use by customers in the form of a public lighting service.

Circular Economy Score
On the circularity scale of Enel X solutions, the smart lighting range has a score of 4.
The solution is based on almost totally renewable raw materials in the production process, while integrating Circular Economy principles into the service delivery.

e-Home

Condensing boiler



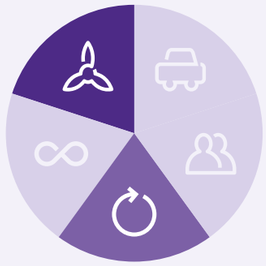
Enel X offers its customers a wide range of condensing boilers – a product aligned with several Circular Economy principles. The boilers recover heat from exhaust gases, thereby reducing energy consumption, and their condensing technology reduces environmental impact. The Enel X Condensing Boiler fulfills 2 of the 5 Circular Economy business models:

- **Sustainable Inputs** – Around 40% of the steel components used to build the boiler are from recycled input. Condensation technology recovers part of the thermal energy from the exhaust, which is lost with a traditional boiler.
- **Recycle & Reuse** – Just 1% of all input materials are discarded, though they are fully recycled.

Circular Economy Score
According to the Enel X Solutions Circularity Scale, the condensing boiler scores a 4.
The solution combines a production process that uses raw materials which are almost totally renewable with service integrated with Circular Economy principles.

e-Home

Photovoltaic



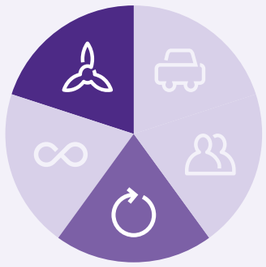
Photovoltaic plants enable Energy Circularity by providing greater efficiency from self-produced energy than drawing energy from the grid. They reduce grid losses, environmental impact and CO_2 production by facilitating energy consumption from renewable sources instead of from fossil fuels. The photovoltaic option offered by Enel X fulfills 2 of the 5 Circular Economy business models:

- **Sustainable Inputs** – Photovoltaic power plants are renewable in the energy production process and 12% of the materials used to produce them comes from recycled input.
- **Recycle & Reuse** – Just 1% of all input materials are discarded, though they are fully recycled.

Circular Economy Score
According to the Enel X solutions circularity scale, the photovoltaic solution scores a 3.
This solution guarantees sustainability even in the product consumption and recovery phases, and the service is partially integrated with circular economy principles

e-Home

Photovoltaic + Storage



Enel X's Photovoltaic and Storage systems produce electricity for domestic energy needs. This solution meets 2 out of 5 Circular Economy business models:

- **Sustainable Inputs** – Photovotaic plants generate renewable energy, which is an important application of sustainable inputs. Storage systems store the renewable energy generated by the photovoltaic plant, increasing customer consumption of self-generated renewable energy. Over 15% of materials used to produce the system come from recycled inputs (copper, aluminum and steel).

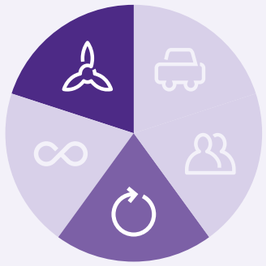
- **Recycle & Reuse** – Just 1% of all input materials are discarded, though they are fully recycled.

Circular Economy Score

According to the Enel X Solutions Circularity Scale, Enel X's photovoltaic power plant solutions score a 3. This particular solution guarantees sustainability in the product consumption and recovery phases, and the service is partially integrated with Circular Economy principles.

e-Home

Solar Thermal



Enel X has chosen to include Solar Thermal in its range of circularity-enabling products. This system directly converts solar energy into thermal energy. The system's efficiency increases the value and energy class of the home, making it partly energy-autonomous, and saves money by using solar energy to heat water and the home. The Solar Thermal solution offered by Enel X fulfills 2 of the 5 Circular Economy business models:

- **Sustainable Inputs** – The Solar Thermal solution is a perfect application of the sustainable inputs business model, since it uses solar energy instead of fossil fuels to heat water, thereby avoiding CO_2 emissions.

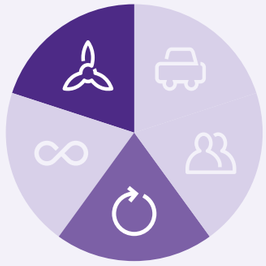
- **Recycle & Reuse** – Only 1% of all input materials are discarded, the great majority are fully sent to be recycled.

Circular Economy Score

According to the Enel X Solutions Circularity Scale, Enel X's solar thermal solution scores a 3. This solution guarantees sustainability in the product consumption and recovery phases, and the service is partially integrated with Circular Economy principles.

e-Home

Storage



Storage accumulates and stores excess energy produced by photovoltaic plants allowing the customer to use it when needed. Thus, with stored energy at his or her disposal, the user is more independent from the electrical grid. Enel X's Storage fulfills 2 of the 5 Circular Economy business models:

- **Sustainable Inputs** – Around 15% of the materials used to build the solutions comes from recycled input. Storage systems are instrumental to increasing the household consumption of energy from renewable resources.

- **Recycle & Reuse** – Just 1% of all input materials are discarded, but are fully recycled. However, the recovered material cannot be reused to produce new batteries. Enel X is committed to finding ways to further increase their recyclability.

Circular Economy Score

According to the Enel X Solutions Circularity Scale, Enel X's Storage Systems score a 3. This solution guarantees sustainability in the product consumption and recovery phases, and the service is partially integrated with Circular Economy principles.

e-Mobility

JuicePole

Enel X's JuicePole is an open-air charging solution designed for public use in the city. Enel X's JuicePole fulfills 4 of the 5 Circular Economy business models:

- **Sustainable Inputs** – Considering the entire JuicePole production cycle, about 30% of the energy used, comes from renewable sources, considering the energy mix of the countries.

- **Product as a Service** – Enel X places its infrastructure at the disposal of other operators who join Enel X's public charging network and can use public JuicePoles to offer charging service through their apps.

- **Sharing Platform** – JuicePoles can be shared with all operators who participate in Enel X's public charging network.

- **Life Extension** – To refurbish charging point technology, Enel X recovers all parts that are still functioning and reuses them for maintenance.

Circular Economy Score

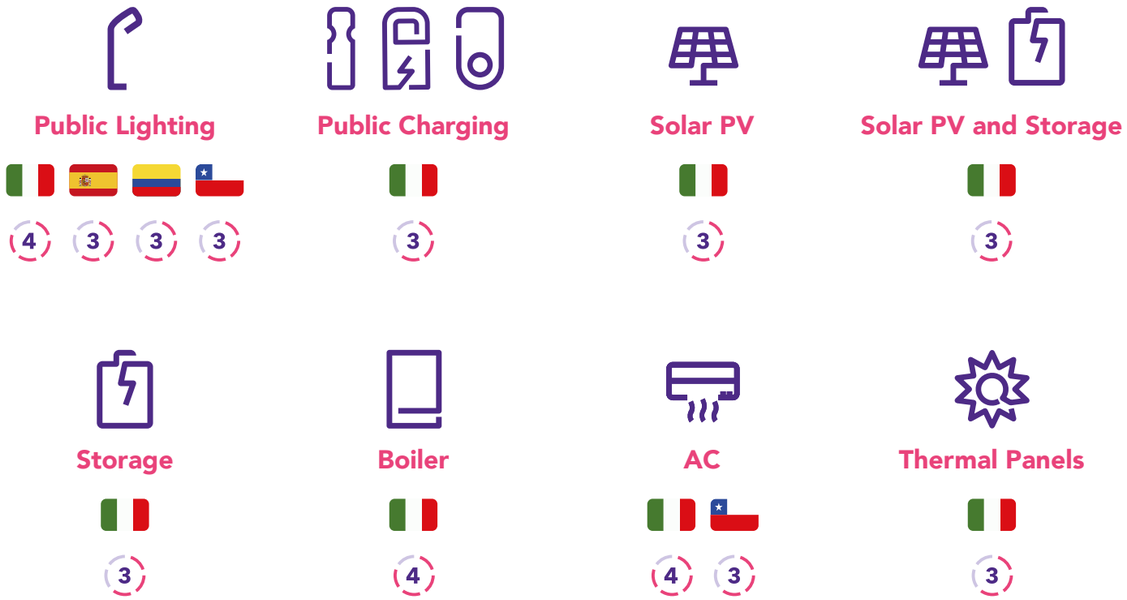
According to the Enel X Solutions Circularity Scale, JuicePole scores a 3. This solution guarantees sustainability in the product consumption and recovery phases, and the service is partially integrated with Circular Economy principles.

2.1.1

THE CIRCULAR ECONOMY SCORES CALCULATED TO-DATE

As previously mentioned, suppliers' collaboration in collecting and providing detailed data about specific products is fundamental for accurate calculations of their CE Scores. To validate suppliers' efforts, Enel X has decided to have a third party like **RINA** certify the calculated CE Scores.

To-date, most CE Scores have been calculated for solutions sold in Italy.



Enel X's CE Score Validated by RINA

The Circularity Scale, ranging from a minimum level of 1 to a maximum of 5, assesses the degree to which our solutions reflect the principles of circularity. This measurement model has been applied to our solutions and certified by RINA, a thirdparty certifier providing an **independent guarantee** of compliance with regulatory standards. What's more, to constantly improve the circularity of our goods and services, RINA certifies each and every CE Score we calculate.

RINA
Circular Solution Score
Validated by RINA

2.2

THE CIRCULAR ECONOMY SCORES FOR SERVICES ONLY

The Circular Economy Score based on Enel's CirculAbility© model assesses the circularity of **Enel X's solutions**, not just physical products but also combinations of products and services.

As Enel X's ambition is to extend the circularity assessment to its entire portfolio, which also includes maintenance and repair services. We have worked on a separate scoring method and model mostly focused on how home maintenance and repair services are delivered by Enel X's third-party suppliers.

Given the wide variety of companies and professionals who are part of Enel X's network, and the focus on how the service itself is delivered – the underlying processes and procedures – the Circular Economy Score for services only is mostly based on a **qualitative scorecard**. The objective is to assess whether and how Enel X's installers and technicians implement circular and sustainable procedures when delivering their home services.

The areas listed below are evaluated:

- **CONSUMABLE MATERIALS** – Purchase and use of recyclable products or those made with recycled materials such as cups, organic cotton clothes, biodegradable solvents and detergents, etc.;
- **EQUIPMENT AND TOOLS** – Access to new purchase models for drillers, core drillers, vacuums, etc., and/or maintenance services to extend the product lifetime and usage rate;
- **MEANS OF TRANSPORT** – Use of electric vehicles (instead of those running on diesel or petrol) to transport workers to customers to reduce environmental impact;
- **INTERVENTION SCHEDULE** – Smart management of appointments to increase efficiency;
- **WASTE MANAGEMENT** – Proper disposal of Waste Electrical and Electronic Equipment (WEEE), correct sorting of personal waste (e.g. used clothing and packaging, damaged or end-of-life equipment and tools, etc.) to maximize reuse and recycling;
- **ENERGY CONSUMPTION** – Use of renewable resources and/or self-generated energy for power consumed in customers' shops or warehouses;
- **TRAINING & EDUCATION** – Participation in training programs focused on sustainable innovations and the Circular Economy, as well as use of web and social platforms to inform clients on how to best use their energy equipment.

Based on these evaluation areas, **Enel X has consolidated the model to assess the Circular Economy Score for home services**.

Moreover, we have defined **guidelines** based on best practises that cover all the evaluated areas to make our home services installers and technicians more "circular" by giving them **simple tips and advice to apply Circular Economy principles**.

2.3

BOOSTING THE CIRCULAR ECONOMY

The **Boosting phase** is where creativity and innovation come into play. Once a solution has been selected and the data collection process to calculate the Circular Economy Score has been activated, the **Sustainability Team** can start the boosting process: value chain analysis followed by a circular intelligence phase and an opportunity screening phase.

Value Chain Analysis

Reconstruction of the solution's **Value Chain** and identification of the **owners of each phase**

- Technical experts
- Sales

Identification of **market and client needs**

Circular Intelligence

Identification of **needs, trends & innovations** with both a **market & client focus**

- Start-ups & innovation
- Case studies
- Market analysis
- Social Media

Opportunity Screening

Selection and prioritization of the **opportunities** that can bring direct and indirect **business value**

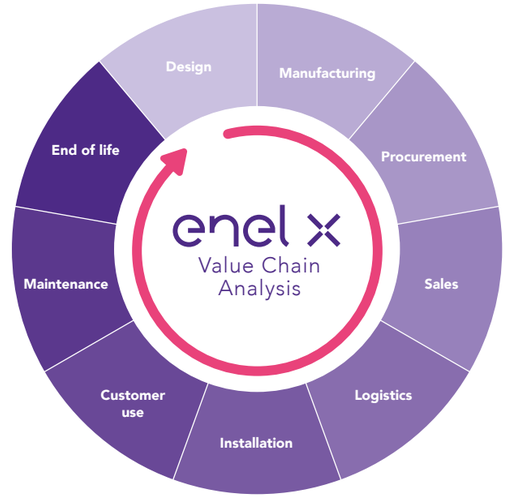
- Technical experts
- Sales

Feasibility evaluation and **fine tuning**

2.3.1

VALUE CHAIN ANALYSIS

To thoroughly understand all the technical and commercial features of a particular solution, structured interviews are held with **technical experts from the respective Business Line** and other key divisions if need be (e.g., HSEQ, AFC, etc.). These technical experts become our **key contacts** during the whole boosting process, starting from the face-to-face interviews that aim to investigate the solutions through a value chain-based approach. The approach has been purposefully designed to identify who owns each step of the value chain and clearly understand how each step is managed.



2.3.2

CIRCULAR INTELLIGENCE

Once the whole value chain has been analyzed, we can start scouting for circular innovations and business models, mainly focusing on **4 areas**:

1. **START-UPS & INNOVATIONS** – to identify disruptive technologies, platforms and business model that could speed up the implementation of circular opportunities;
2. **CIRCULAR ECONOMY CASE STUDIES** – to identify key strengths and weaknesses of innovative CE value propositions that are already made available in the market from our peers and suppliers;
3. **BUSINESS INTELLIGENCE & MARKET ANALYSIS** – to identify and analyze the latest trends in specific technologies and markets;
4. **SOCIAL MEDIA INTELLIGENCE** – to selectively analyze customers' perceptions and needs.

2.3.3

OPPORTUNITY SCREENING

The final output of the **Circular Intelligence** phase is a long-list of new business models and technologies to be integrated within Enel X's value proposition, including: the underlying Circular Economy principle(s), the value hotspot for Enel X, as well as relevant examples from the market whenever available. The long-list is to be discussed and reviewed with the previously identified technical experts involved to collect feedback (e.g., echnical and economic feasibility) and stimulate new ideas. This process help come up with a short-list of project to be developed and implemented.

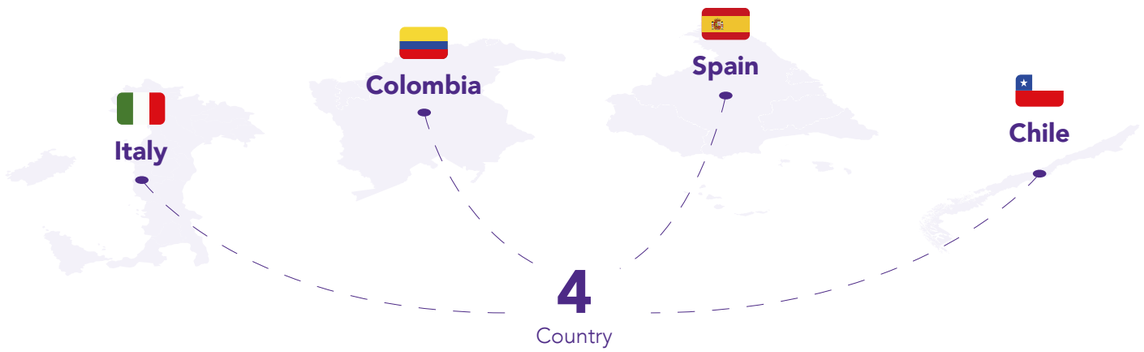
2.3.4

CIRCULAR ECONOMY BOOSTINGS DELIVERED TO-DATE

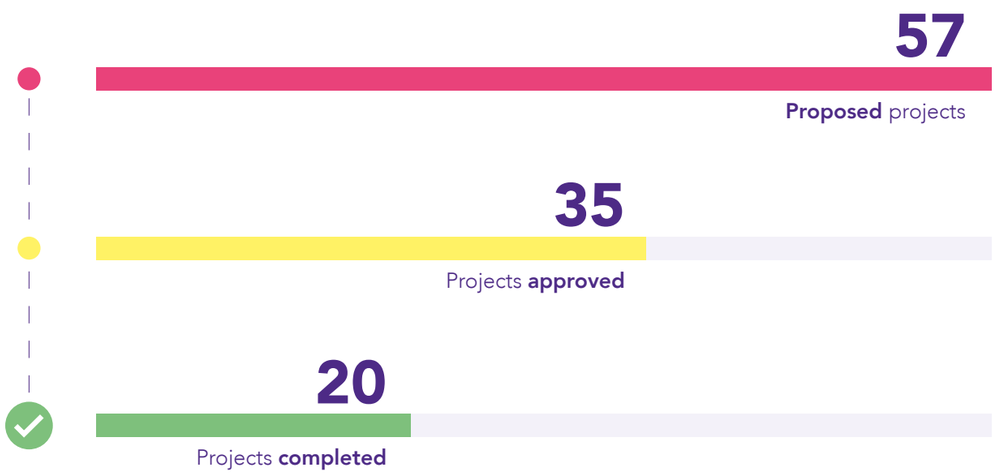
In order to test and consolidate our Circular Economy Boosting methodology, we focused on the **Italian market** first, then gradually extended our scope of action to **Spain**, **Chile**, **Colombia**, **Argentina** and **Brazil**.

To identify and select the solutions that could benefit the most from our Boosting, we constantly work with key contacts from the Business Lines and the countries concerned. We analyze every Business Line's and country's portfolio performance and budgets to identify the most strategic solutions. After receiving the green light from our Circular Economy contacts, we activate the Boosting process.

A good variety of countries and solutions has been Boosted to-date.



4
Country



The Circularity of Demand Response

Demand Response programs are a **strategic solution provided by Enel X's e-Industry Business Line**. Given the intangible nature of this program, we have decided to run a slightly different Boost by explaining why demand response is an opportunity to increase companies' circularity and developing a methodology to assess **Enel X's clients' circularity** based on their participation to Demand Response programs.

Sustainable inputs

Supports integrating renewable energy into the grid, thereby mitigating grid unpredictability.

Lowers the need to use old, polluting power.

Sharing

Leverages exsisting energy capacity to meet peak demand instead of building new power generators.

Enables **businesses and end-consumers to provide non-critical energy capacity to the grid**.

If you'd like to find out more about the circularity of Demand Response, visit **enelx.com**.

2.4

IMPLEMENTING CIRCULAR ECONOMY BOOST SOLUTIONS

As a result of the whole Boosting process, **35 projects** across **4 countries** have been selected for local implementation. While some of them might still need operational support and consulting from the Sustainability Team, full responsibility has been given to the Business Line or country for most projects.

Circular Economy Flagship Project #1

Use of regenerated spare parts for maintenance purposes

Enel X has identified opportunities **to extend the lifetime** of its EV charging infrastructure (e.g., Pole Station, Juice Pole, etc.) thanks to end-of-life valorization procedures such as the remanufacturing and regeneration of spare parts for maintenance and repair purposes.

The advantages are clear. Regeneration reduces the need for brand-new spare parts, thus reducing our environmental impact and procurement costs. Waste volumes are reduced by reusing components that are still in good condition, further cutting costs by avoiding waste treatment and disposal.

As a result of this Boosting, we have defined a new contract clause dedicated to **Sustainability and the Circular Economy**, which requires our EV charging infrastructure technicians to identify, separate and recover functioning spare parts for maintenance and repair purposes.

Solution
Public Charging

Business Line
e-Mobility

Country
Italy

Circular Economy Model
Life exstension

Value for Client
Waste reduction

Value for Enel X
Cost reduction

Circular Economy Flagship Project #2

Use of recycled materials for Enel X's JuiceBox

It is an undeniable that awareness of environmental issues **is increasing**, caused by issues like extremely common pollutants, such as plastics.

Building upon this trends, internal discussions with our e-Mobility engineers revealed the opportunity to use recycled plastics to produce new charging stations.

So we started engaging specialized suppliers and partners to properly recover and recycle end-of-life plastics we produced the first batch of JuiceBox with recycled plastics and started a series of tests to verify their safety. We have obtained all the certifications and will start the production of the first production batches for the market in the last months of 2020, obtaining important savings on the purchase cost of recycled plastic compared to virgin plastic.

Solution
Private Charging

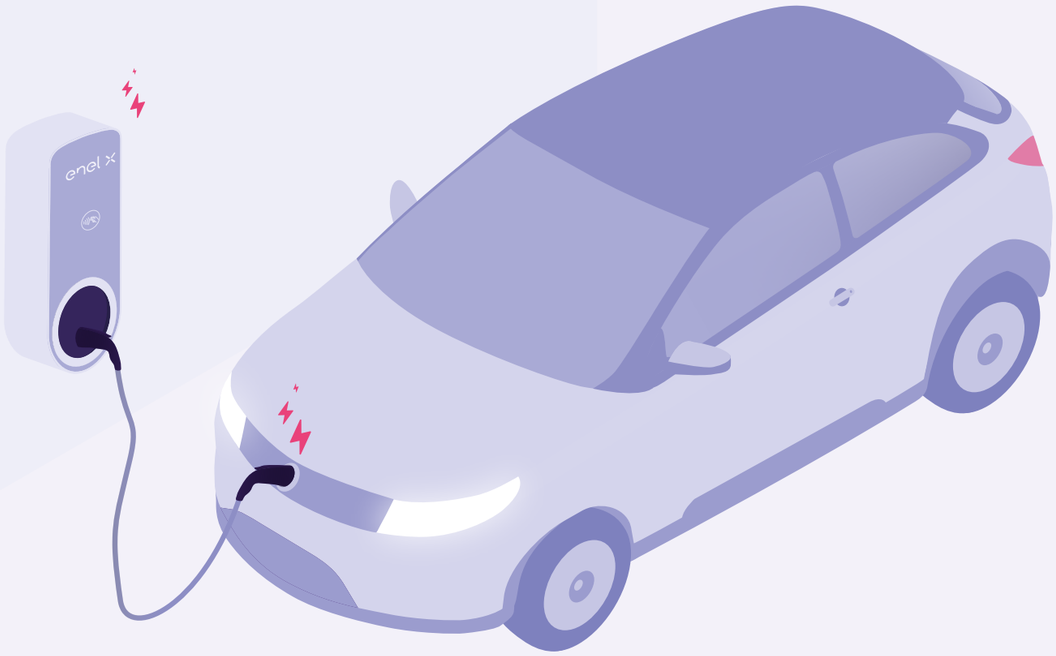
Business Line
e-Mobility

Country
Italy

Circular Economy Model
Sustainable Inputs and Recycle & Reuse

Value for Client
Access to greener products

Value for Enel X
Customer loyalty



Circular Economy Flagship Project #3

Refurbish or recycle boilers and other equipment

We have identified opportunities to extend the lifetime of our residential products in Spain (e.g., boilers, water heating, etc.) thanks to end-of-life valorization procedures.

The current project involves correctly refurbishing or recycling two types of equipment depending on their origin:

- **E1: Like New (Damaged-packaging equipment)**. Equipment in original packaging that cannot be returned to factories because of damage during transport or incorrect first installation.
- **E2: Potential Refurbish Equipment**. Equipment that is removed from customers' houses when new equipment is installed.

The equipment will be tested to see if it works or can work after being repaired. Working equipment will be refurbished and then sold or donated as part of the CSR initiative. If the equipment does not work, it will be recycled.

The objective is to achieve some economic gain from all checked equipment.

The advantages are clear. Refurbishment will create a new customer base, thus reducing our environmental impact as well as stock costs. Waste volumes are reduced by reusing components that are still in good condition, which further cuts costs by avoiding waste treatment and disposal and reusing old assets that are still functional.

Solution
Boilers

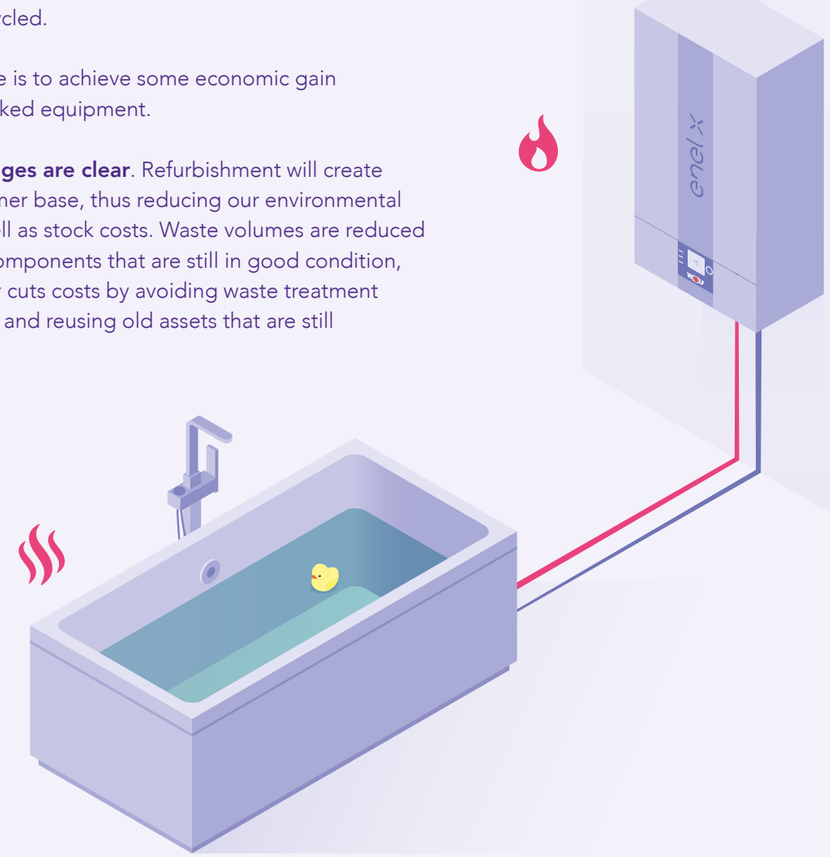
Business Line
e-Home

Country
Spain

Circular Economy Model
Life exstension

Value for Client
Waste reduction

Value for Enel X
Customer base and Cost saving



2.5

RE-SCORING OUR SOLUTIONS

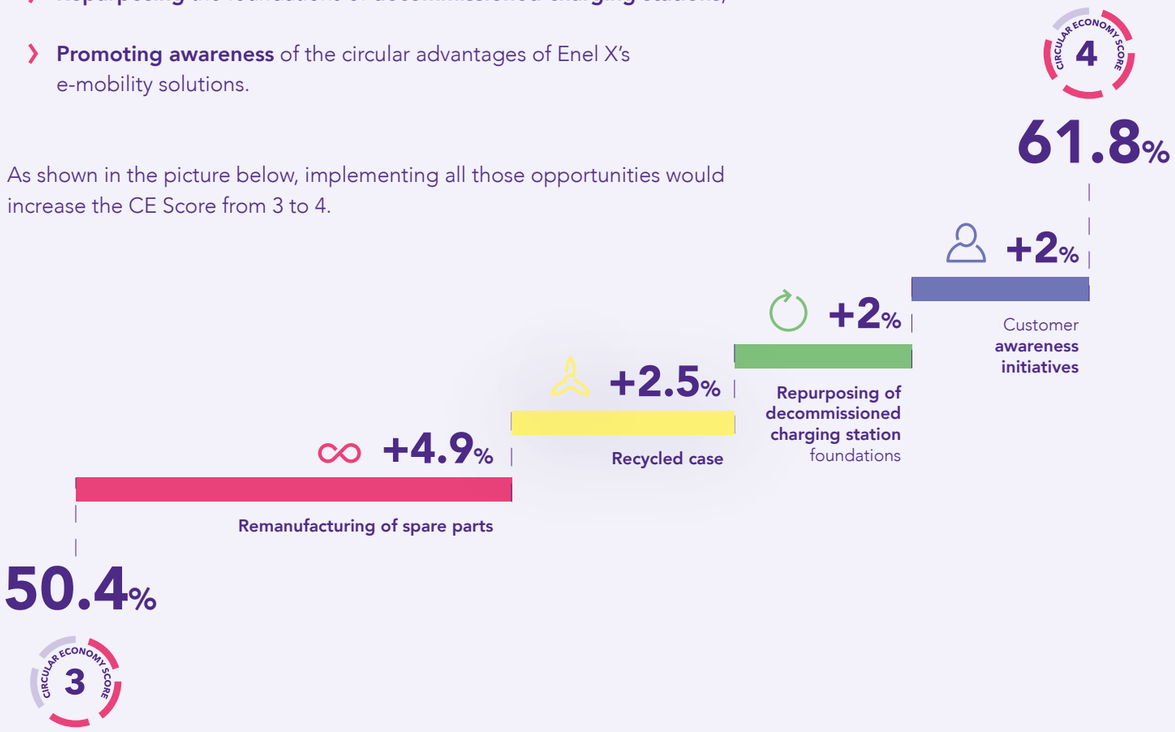
Thanks to the implementation of projects like those described in the previous section, **Enel X has the opportunity to actually boost the circularity of its portfolio of solutions**. To keep track of our improvements, the Circular Economy Score comes into play once again. By reviewing the key components of the scoring model, which is based on the key features and the impact of the projects being implemented, we are able assess the new circularity level. Properly designing proposed circular ideas and opportunities during the Boosting phase can help estimate a to-be Circular Economy Score, thereby helping prioritize the projects to be implemented.

Boosting & re-scoring Public Charging

When we first assessed the circularity level of **Enel X's Juice Pole**, a Public Charging solution in Italy, the CE Score was 3. During the **Boosting process**, the following opportunities were identified:

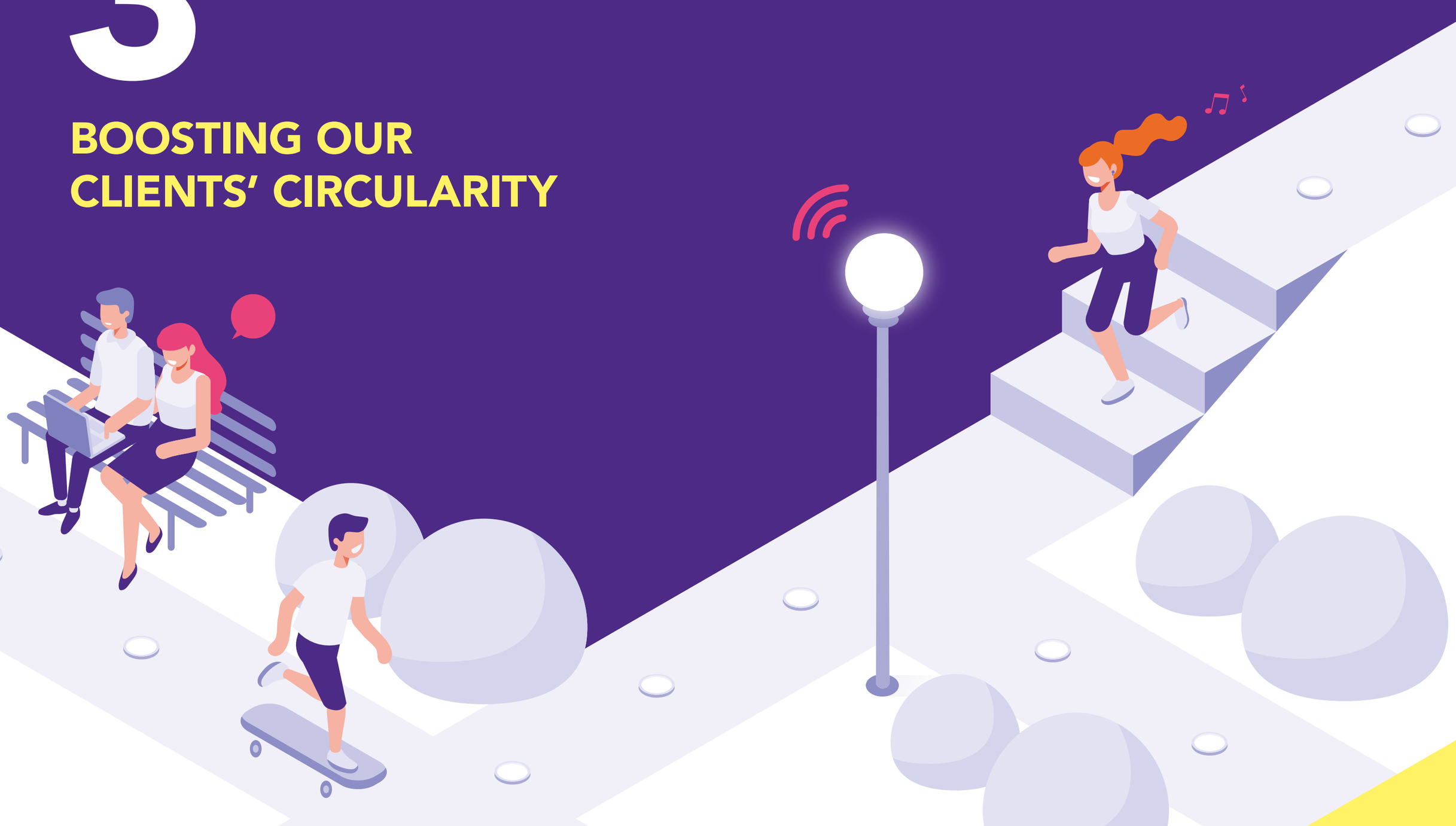
- Using **remanufactured spare-parts** for maintenance purposes;
- Requiring our suppliers to **use recycled plastic** to produce new charging stations;
- **Repurposing** the foundations of **decommissioned charging stations**;
- **Promoting awareness** of the circular advantages of Enel X's e-mobility solutions.

As shown in the picture below, implementing all those opportunities would increase the CE Score from 3 to 4.

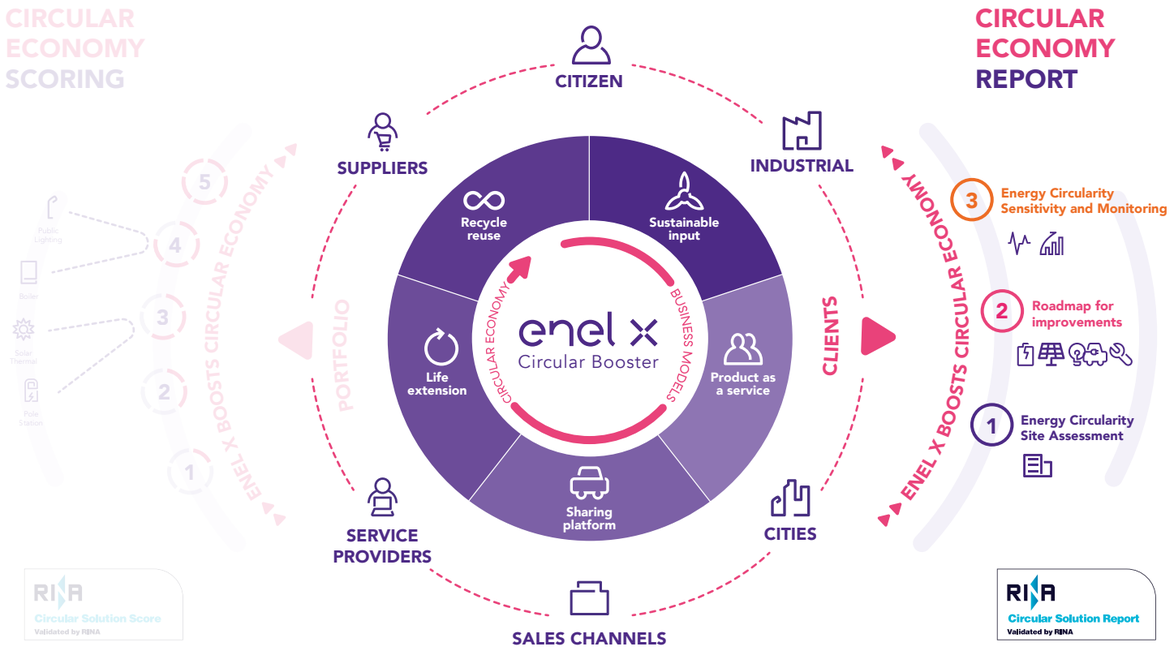


3

BOOSTING OUR CLIENTS' CIRCULARITY



While consolidating and testing the Boosting approach for our own solutions, we have started to shift our attention towards our clients as well. The Circular Economy is becoming a solid differentiator in terms of **innovation** and **sustainability** for businesses and public administrations. Given Enel X's ambition to become a Circular Economy enabler and facilitator, the Sustainability Team has developed two brand-new scoring models: the **Circular Economy Client Report** for private clients and the **Circular PA Report** for public administrations.



Both reports aim to support the Circular Economy transition of our clients and are based on following 3 key components:

- **GAP ANALYSIS OR SCORING** – Starting from the as-is assessment, key areas of improvement are identified;
- **ROADMAP OR BOOSTING** – Specific solutions are designed and prioritized to help clients address their investments and efforts through a customized roadmap, including detailed information on Enel X's portfolio solutions whenever available;
- **SENSITIVITY ANALYSIS OR RE-SCORING** – The potential impact that implementing Enel X's proposed solutions could have on the client's as-is circularity is calculated.

In this case, the **IMPLEMENTING** phase is up to the client. Nevertheless, we make sure that our clients are provided with exhaustive information to make the necessary decisions on the interventions to be implemented in order to increase their circularity level.

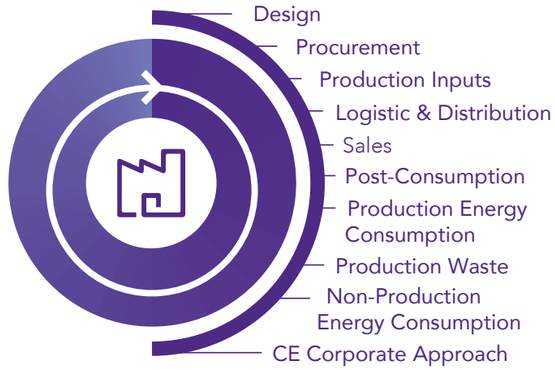
3.1

THE CIRCULAR ECONOMY CLIENT REPORT

Targeting both manufacturing and service companies, this report provides our clients with a **step-by-step assessment** of and guide to the Circular Economy. The Circular Economy Client Report measures clients' circularity from 2 points of view:

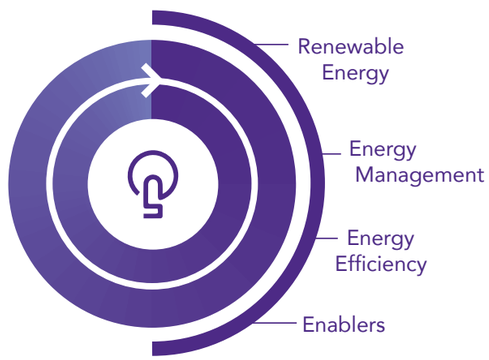
› CORPORATE

The **Corporate Circular Economy Assessment** is a qualitative evaluation of the level of Circular Economy principle maturity and adoption throughout the business value chain, from **design** and **procurement to sales** and **post-consumption**. This approach helps our clients focus on business aspects with the most room for improvement.



› SITE SPECIFIC

The **Site Specific Energy Circular Economy Assessment** is a quantitative evaluation of the level of Circular Economy principles as implemented in one specific site or building's energy sources and energy consuming systems.
The analysis and output score highlight any quota of energy covered by **Guarantees of Origin** and of **self-produced** energy from renewable resources.



RINA Circular Economy Report Validated by RINA

Enel X's CE Client Report Validated by RINA

The Circular Economy Client Report assessing clients' energy and corporate circularity is a methodology validated by RINA.

What will I find in a Circular Economy Client Report?

Corporate Assessment

The output of the Corporate **Circular Economy Assessment** is a percentage score that indicates the full **maturity level of the company in terms of the Circular Economy**. The **Corporate CEA** is the result of a qualitative analysis of the whole company, conducted thoughtout the value chain (i.e. Design, Procurement, Waste Management, Post consumption, Sales Models, etc.).

Area	Description
Design	Maturity and diffusion of circular design principles (e.g., design for modularity and/or disassembly) enabling/facilitating repairs & maintenance or recovery & recycling.
Procurement	Maturity and adoption of circular criteria in suppliers' procedures, and circular business models for purchasing materials, equipment, office supplies, etc.
Production inputs	Consumption of renewable, recycled or biodegradable materials and of second-hand or regenerated components from all production material inputs.
Production energy consumption	Consumption and self-generation of renewable energy, and recovery and reuse of waste energy out of the overall energy consumed at the production site(s).
Production waste	Adoption and maturity of reuse or recycling practices to recover own production waste as secondary raw material or alternative fuel, either internally or in other loops.
Logistics & Distribution	Adoption of electric mobility solutions in the production and distribution processes, use of EVs and shared vehicles in the corporate fleet.
Sales	Adoption and maturity of circular principles and business models in sales (e.g., possibility to buy product in sharing or as a service, life extension services, etc.).
Post-consumption	Adoption and maturity of reparation & maintenance services to extend product life, and collection for end-of-life phase (e.g., recovery, reuse, recycling, etc.).
Non-production energy consumption	Consumption and self-generation of renewable energy out of overall energy consumed in the offices, POS, werehouse, etc.
CE Corporate approach	Corporate CE maturity in terms of alignment with the business strategy and planning, as well as employees', suppliers' and consumers' levels of engagement with CE topics.

Note that for Service companies (instead of Manufacturers), some of the above areas are excluded from the analysis.

The Corporate CE Assessment also provides an **analysis of the extent to which the company's projects, initiatives or objectives satisfy any of the UN's Sustainable Development Goals**.

30%*

Corporate CE

The percentage score indicating the as-is situation of the company analysed at a Corporate level

* The percentage number is an example

Energy Assessment

The output of the **Energy Circular Economy Assessment** is a percentage score that indicates the maturity level of Energy Circularity, reflecting the result of a quantitative analysis focused on renewable energy, efficiency, energy management, and circular enablers areas (production, administrative, logistics, commercial ect.).

Area	Components
RENEWABLE ENERGY	Total renewable energy consumption
	Renewable electricity - total self generation
	Renewable electricity - total self consumption
	Renewable electricity - self consumption from storage
	Renewable termal energy - total self generation
	Thermal energy from CHP and process heat waste recovery system
ENERGY EFFICIENCY	Lighting
	Space heating
	Cooling
	Air treatment
	Data centers
	Water heating
	Office equipment (e.g., computers, displays, imaging equipment)
	Windows - insulation
ENERGY MANAGEMENT	Maintenance
	Monitoring & verification
	Electrical system efficiency
	Sensors/dimmering for lighting
	Space heating temperature management
ENABLERS	EV charging infrastructure
	Grid services

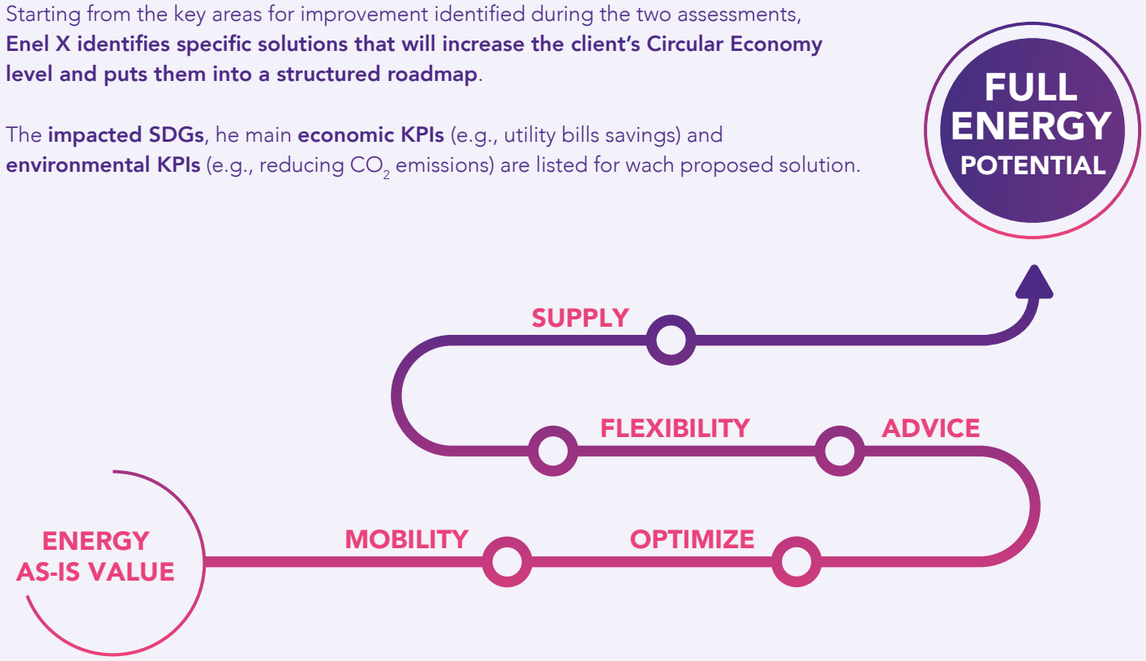
The percentage score indicating the as-is situation of the selected site in terms of Energy Circularity

* The percentage number is an example

Customized Roadmap

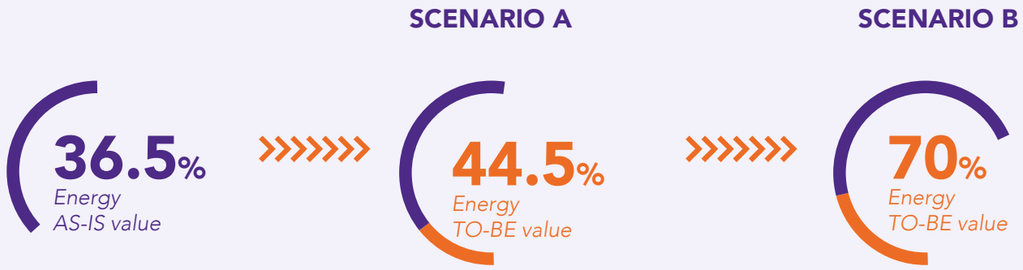
Starting from the key areas for improvement identified during the two assessments, **Enel X identifies specific solutions that will increase the client's Circular Economy level and puts them into a structured roadmap**.

The **impacted SDGs**, he main **economic KPIs** (e.g., utility bills savings) and **environmental KPIs** (e.g., reducing CO_2 emissions) are listed for wach proposed solution.



Sensitivity Analysis

Finally, the report illustrates the **potential impact that implementing Enel X's proposed solutions could have on the Circular Economy scores** based on different scenarios.



Main Benefits for the Client Company

Planning Tool

The report allows you to **set targets** and **identify** and **prioritize the right actions** to meet them

Strategic and Competitive Tool

A business strategy based on Circular Economy principles allows to **increase the value of the company** on the market

Tool for Credit Facility

The solutions proposed in the **report provide access to ceilings dedicated** to the Circular Economy with favorable conditions

Instrument of Communication

Credible and effective storytelling tool for the market to **narrate business initiatives and results** in terms of **sustainability** and the **Circular Economy**

Cost and CO_2 Saving Mechanism

Identification of **energy** efficiency **opportunities**, mostly to both **cut cost** and **CO_2 emissions**

The Sustainability Awards

The Sustainability Awards program provides recognition from a panel of volunteer judges who themselves are leaders and experts in business and honor those who have made sustainability an integral part of their business practice.

ENEL X was awarded Sustainability Service of the Year in 2020 for its Circular Economy Report.

3.1.1

THE CIRCULAR ECONOMY CLIENT REPORTS DELIVERED TO-DATE

In 2019, we tested the **Circular Economy Client Report** on ourselves with the help of **Cosentino**, one of our clients in Spain. In 2020, we continued our work and delivered a report for the Romanian company and for about 40 Italian companies in different production sectors and service activities, including Mithubishi, Genagricola, a company of the Generali group and Csp International Fashion Group.

Italy

72.2% Projects **completed**

27.8% Projects **ongoing**

Spain

100% Projects **completed**

Romania

100% Projects **completed**

In 2020, we started focusing our efforts on promoting the CE Client Report both in and out of Enel X. We have formed a partnership with Confindustria to promote the report among associated companies by offering **special benefits** and **incentives**.

The partnership began during the award ceremony of the "Best Performer of the Circular Economy" organized by Confindustria. The winning companies **have been awarded with Enel X's Circular Economy Client Report**. Moreover in 2020 several webinars have been conducted to communicate and promote Circular Economy tools and initiatives.

CE Report Overview

Mitsubishi Electric Hydronics & IT Cooling Systems SpA

Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A. (MEHITS) came to Enel X to begin its journey toward circularity. MEHITS designs, produces, and markets innovative, energy-efficient products, and provides value-added services for Indoor Climate Control in commercial buildings and for Refrigeration (ICC&R) of industrial processes and ICT applications through the brands CLIMAVENETA and RC.

Gap Analysis

CORPORATE CIRCULARITY FOR MEHITS

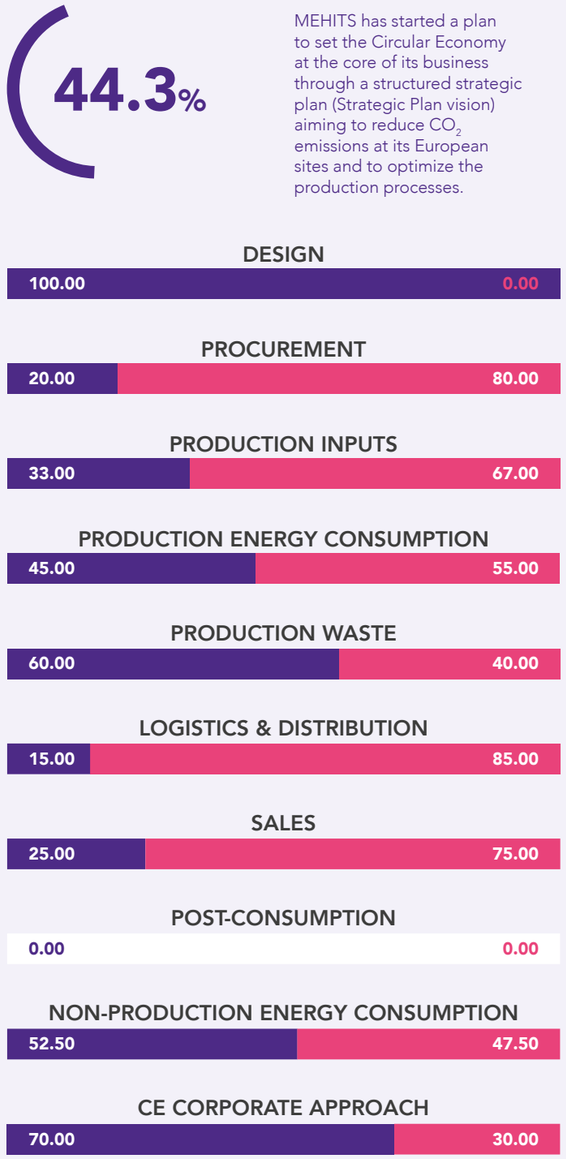
Enel X thoroughly evaluated each point in the value chain to establish how MEHITS applies the principles of the Circular Economy, and where the main gaps lay.

Key strengths

- One of MEHITS's main Circular Economy strengths is the integration of modularity principles in its product design. They are easy to access for repair and updates. Furthermore, at the end-of-life, it is easy to disassemble and recover most of the components.
- As the graph shows, the "Non-production energy consumption" area has a good starting level with a high percentage of consumption from renewable resources.
- From a sustainable development and Circular Economy point of view, MEHITS already handles those issues well. Long-term strategies are already in place, with targets dates in 2030 and 2050, to reduce CO_2 factories emissions.

Key areas for improvement

- The current score of 44.3% can be further improved by working on the Procurement and Logistic & Distribution areas.



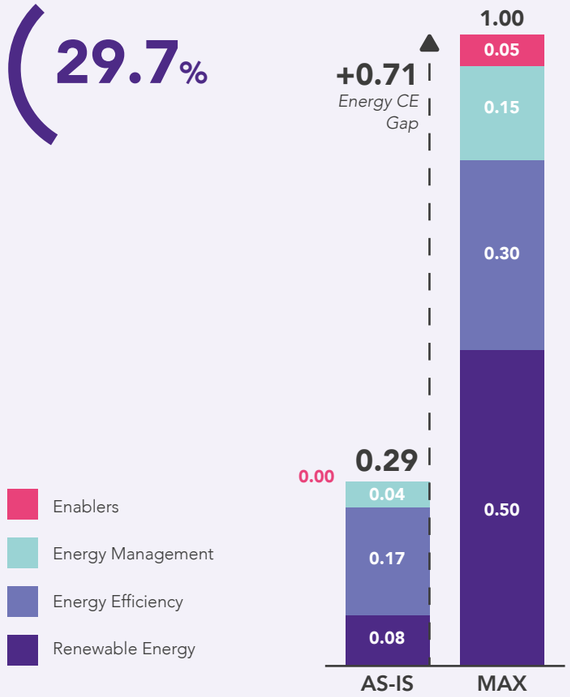
MEHITS has started a plan to set the Circular Economy at the core of its business through a structured strategic plan (Strategic Plan vision) aiming to reduce CO_2 emissions at its European sites and to optimize the production processes.

Enel X helped Mitsubishi identify its existing level of circularity with two levels of assessment in the Circular Economy Report: the Corporate Circular Economy and the Site Energy Circular Economy. This path complements Mitsubishi's strategy to increase well-being and industrial productivity by providing highly efficient, reliable, economically viable and eco-sustainable solutions, especially by embracing renewable energy sources.

Gap Analysis

ENERGY SITE CIRCULARITY FOR MEHITS (BASSANO DEL GRAPPA FACTORY)

Enel X thoroughly evaluated how MEHITS applies the principles of the Circular Economy at each point of the value chain and where the main gaps lay.



Key strengths

- The building under analysis uses a good percentage of electricity from renewable sources for energy consumption, as declared by MEHITS' supplier Hera*.
- From an efficiency point of view, all the office equipment has a energy efficiency label (e.g. EU EcoLabel, Energy Star, etc.).

Key areas for improvement

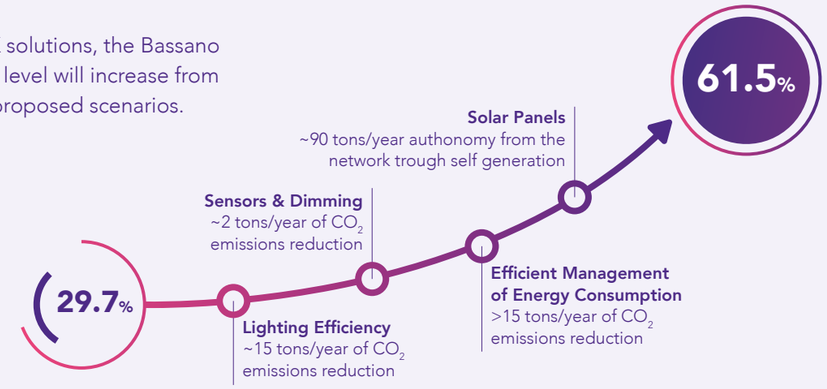
- The score of 29.7% can be further improved by working on lighting efficiency and smart energy management.

* Guarantees of Origin

Roadmap

ENERGY CIRCULARITY FOR MEHITS

By integrating the proposed Enel X solutions, the Bassano del Grappa site's Energy Circularity level will increase from 29.7% to 61.5% in the best of four proposed scenarios.



3.2

THE CIRCULAR CITY REPORT

National policies about and citizens' awareness of the Circular Economy are also growing, forcing Public Administrations all over the world to set and comply with new, challenging targets. With this report, **Enel X wants to help Public Administrations** better focus their efforts to meet **emerging expectations** and **set an example for other municipalities**. The Circular PA Report aims to measure 2 dimensions of public aAdministrations' Energy Circularity:

- **PUBLIC ADMINISTRATION-WIDE**,
- **SITE-SPECIFIC**.

The Public Administration-Wide Energy Circularity assessment is a detailed, yet qualitative evaluation of the level of Circular Economy principle maturity and adoption within a municipality, focusing on key areas both directly and indirectly related to energy.

The Public Administration-Wide Energy Circularity assessment areas are:

Mobility

Focus on **electric vehicles**, for **private and public mobility (e-bus)**, and sharing programs

Energy

Focus on **renewables and energy efficiency** in public buildings, areas and streets

Emissions

Focus on **air quality** (i.e., PM 2.5 and PM10) and **CO_2 emission intensity**

Waste

Focus on **municipal waste and e-waste recycling**, and waste sent for **energy recovery**

Smart Buildings

The actions we suggest will reduce energy consumption in public buildings, while also reducing CO_2 emissions in the city.

Making public buildings more efficient means redeveloping existing structures and making new constructions sustainable, providing users and workers with more comfortable environments with complete respect for the ecosystem.

Sustainable Public Transportation

In the journey toward sustainability for our urban centers, Enel X strongly believes in the essential role of electric mobility – both private and public.

Enel X supports institutions and market operators in revolutionizing the concept of urban transport, leveraging the transition to electric vehicles.

Furthermore, a set of sub-questions has been defined in each area and organized into four main categories typical of public administrations (i.e. Governance & Policies, Support Tools, Digitalization and Current Performance):

- **GOVERNANCE & POLICIES** – Existence of local targets, plans and procedures promoting Circular Economy (CE) and CE-related topics and those which are stricter or more ambitious than regional/national frameworks and policies.
- **SUPPORTING TOOLS** – Implementation of municipal initiatives and incentives to promote circular approaches and behaviours among citizens andlocal businesses, shch as tools to monitor targets and progress.
- **DIGITALIZATION** – Implementation of digital tools to enable, promote or facilitate circular approaches and behaviours among citizens and local businesses.
- **CURRENT PERFORMANCE** – Evaluation of the as-is achievements and results in regard to specific CE-related topics and areas.

The exact same structure of the Circular Economy Client Report is used for the site-specific Energy Circular Economy Assessment. Only considerations related to grid services have been omitted due to the social nature, and minimum quality and safety requirements of services provided in public buildings.

Main Benefits for Public Administration

Territorial Planning Tool

Addresses **policies** and **strategies** towards a path of sustainability and Circular Economy at the local level

Instrument of Institutional Communication

Effective storytelling and communication tool for stakeholders, to activate **territorial marketing** strategies and **attract people** and **investment**

Management and Monitoring Tool

Through the report it is possible to dynamically **measure** and **monitor progress** in the circularity path, exploring new development opportunitie

Energy and Costs Savings Mechanism

The identified solutions not only allow to increase the level of circularity, but also to **generate energy efficiency**, enabling significant savings in economic terms

Accelerator Quality of City Life

The path allows greater attention to **environmental sustainability**, **improving the quality of life** and **urban livability** thanks to the reduction of CO_2 emissions

Serrenti Municipality

Enel X awarded Serrenti, a city of 5,000 residents in southern Sardinia, with the “Cresco Award - Sustainable Cities” during ANCI’s 35th annual meeting. The award recognizes a high concentration of **innovation**, the use of **renewable** and **digital technologies** and an approach marked by the **Circular Economy**. As a result of this recognition, Serrenti has began a journey with Enel X toward circularity that involves the Municipality itself and Angius Middle School.

Gap Analysis

CITY CIRCULARITY FOR SERRENTI MUNICIPALITY

Enel X thoroughly evaluated how the Municipality of Serrenti applies the principles of the Circular Economy at each point of the value chain, and where the main gaps lay.

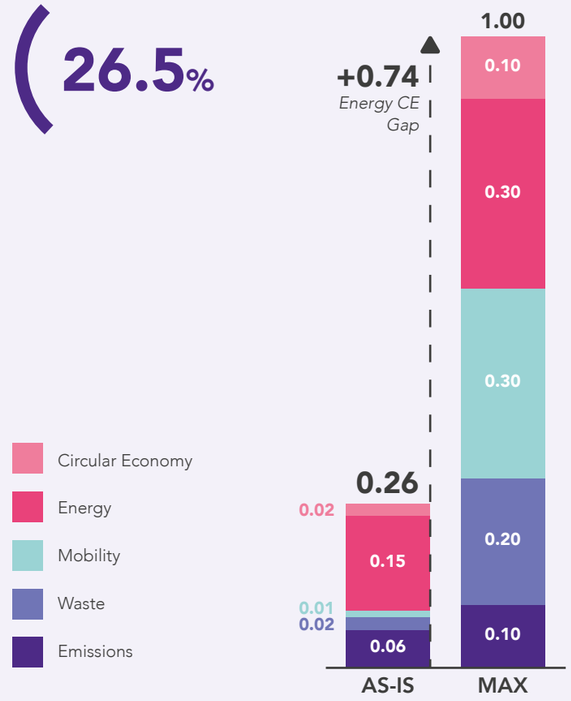
26.5%

Key strengths

- The “House of energy” and “E.C.0 Energy” projects both include actions to improve energy efficiency and awareness-raising initiatives for citizens.
- Electricity consumption 100% renewable: photovoltaic systems on the roofs of 9 municipal buildings and 100% green supply contract with guarantees of origin.

Key areas for improvement

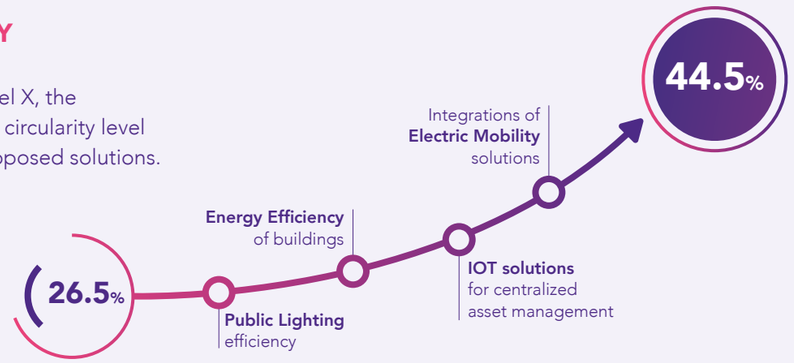
- The score of 26.5%, presents wide margins for increase by working on electric mobility solutions, waste management and monitoring air quality.



Roadmap

ENERGY CIRCULARITY FOR SERRENTI MUNICIPALITY

Thanks to a roadmap suggested by Enel X, the Municipality of Serrenti will increase its circularity level from 26.5% to 44.5% by integrating proposed solutions.



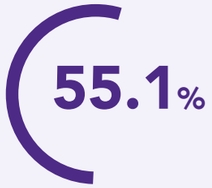
Angius Middle School

The award from Enel X allowed the Municipality of Serrenti to make use of an "Energy Assessment" at Angius Middle School. The school, which already had a high Circular Economy Score of 55,1%, will increase this score to 61,5% with Enel X's support and guidance.

Gap Analysis

ENERGY CIRCULARITY FOR "V. ANGIUS" MIDDLE SCHOOL

Enel X thoroughly evaluated how the Angius Middle School applies the principles of the Circular Economy at each point of the value chain, and where the main gaps lay.



Key strengths

- Presence of photovoltaic panels and storage system for the self-production of electricity from renewable resources.
- Building equipped with thermal coat and double glazing.

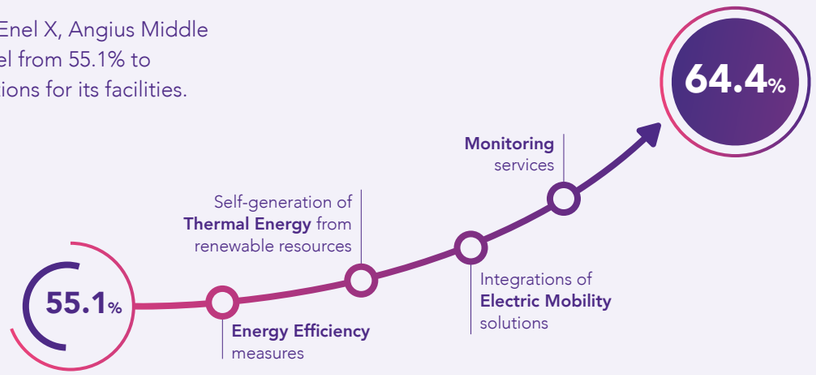
Key areas of improvement

- The score of 55.15% leaves room for improvement by working on lighting efficiency and electric mobility solutions.

Roadmap

ENERGY CIRCULARITY FOR "V. ANGIUS" MIDDLE SCHOOL

Thanks to a roadmap suggested by Enel X, Angius Middle School will increase its circularity level from 55.1% to 64.4% by integrating proposed solutions for its facilities.



4

ENEL X'S CIRCULAR ECONOMY TRAINING PROGRAMS & COMMUNICATION

Enel X is strongly committed to spreading the **circular culture**, both internally and externally. Building upon our significant experience and vast knowledge of the topic, we create **informative** and **educational content** to be shared with stakeholders.

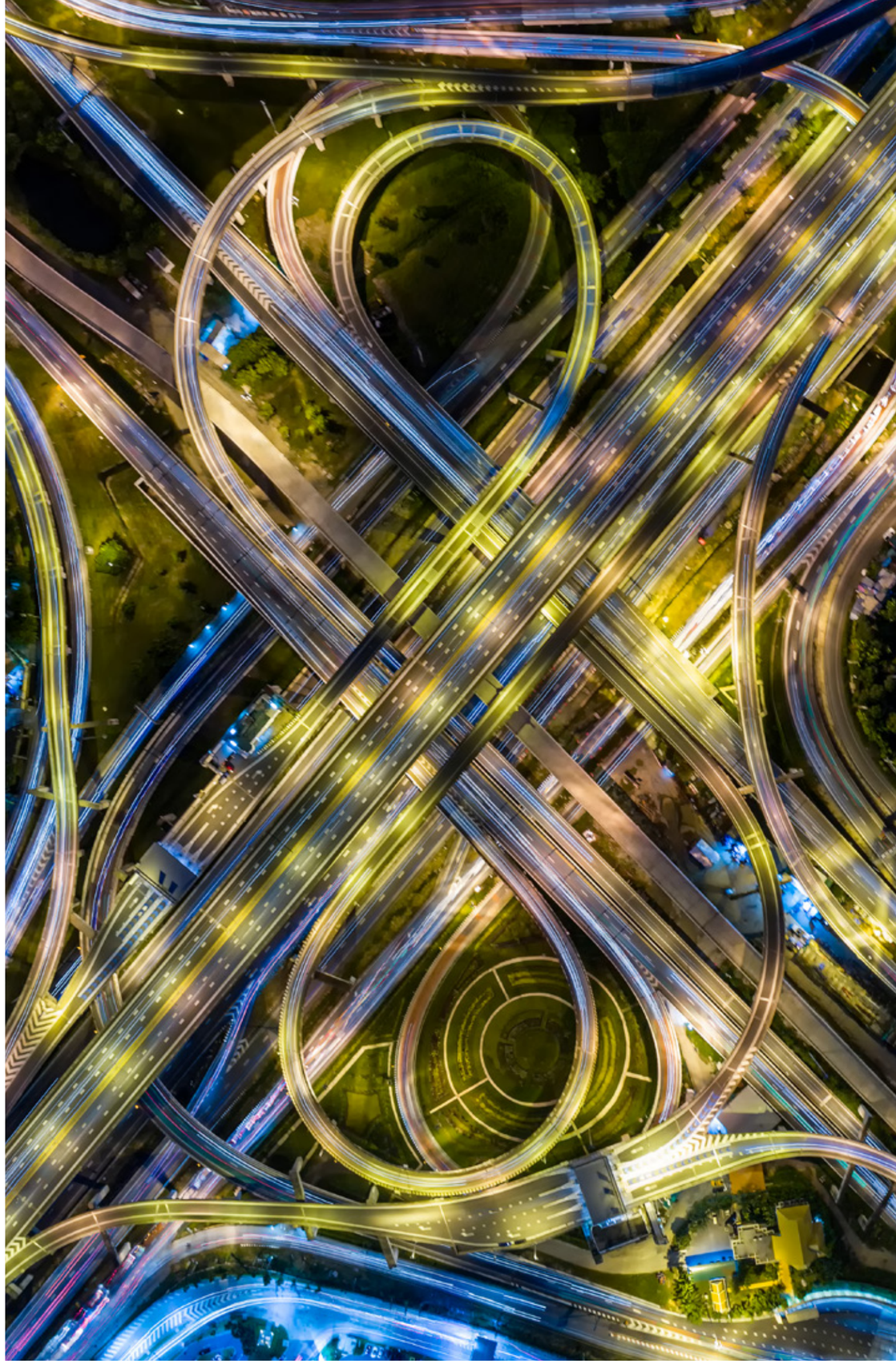
Internally, Enel X strives to train its employees and spread the circularity culture through education and training via ad-hoc training sessions for specific roles who play a role in key activities linked to the Circular Economy, through more general training sessions accessible to all employees, such as webinars and workshops, and through internal communication initiatives, which use various tools and channels, aimed at different audiences.

Overall, this can be divided into two main categories:

1. **EDUCATIONAL INITIATIVES** – These include specific training initiatives developed for individuals involved in the Boosting program to maximize their contribution and a general training platform for everyone.

2. **AWARENESS INITIATIVES** – These include Circularity Day, replicable in all countries, which is one entire day for local employees to discuss Circular Economy principles, Enel X's approch and to answer questions.

Enel X has gone to great lengths to create a fertile setting for internal collaboration around the Circular Economy by fostering and rewarding what we call **Circular Thinking** at all levels.



4.1

TRAINING OUR EMPLOYEES

The Boosting Program

When we first set up the Circular Economy Boosting Program for our portfolio of solutions, we worked hard on selecting our Circular Economy focal points, in order to create a global network of 20+ key contacts to support us in promoting Circular Economy awareness and in implementing circular projects. The role of Circular Economy focal points can be described in three points:

- A **point of reference and support** for colleagues who have no Circular Economy background and are interested in Circular Economy topics and/or related innovation and business opportunities;
- A **team member** ready to collaborate with his/ her Circular Economy network peers to generate, discuss and implement Circular Economy ideas;
- A **knowledgeable colleagues** who collects information for the Sustainability Report and for strategies and projects specifically related to his/ her Business Line.

Overall, the Circular Economy focal points training was not only a key step in the developing the Boosting program, but also a networking opportunity that fostered collaboration among Enel X employees from various countries and roles.

Sales Force Training

Enel X decided to train its sales force to foster promotion of the CE Client Report among its B2B clients. This was carried out through intensive training sessions with Key Account Managers.

Approximately 30 of them took part to learn about Circular Economy principles and the structure, objectives and benefits of the Circular Economy Client Report. The main objective of the training was to prepare them to offer the report to existing and target companies, thereby becoming a key channel for Enel X.

Enel X Circularity Days

We organize a Circularity Day in every country involved in the Circular Economy Boosting program. The event consists of a training day aimed at introducing Circular Economy principles and the Circular Economy Boosting program to the country that has selected to boost one or more solutions.

In 2019, we organized 5 Circularity Days in Spain, Chile, Colombia, Argentina and Brazil. The Circularity Day has become a formal kick-off to involve a country in the Boosting program, which is then followed by a variety of meetings between the Italian Sustainable Products Development Team and local Circular Economy focal points and technical experts.

The Circular Economy Academy

We have developed online training about the Circular Economy, which is accessible to all employees through the e-ducation platform. The idea is to transform the content created throughout the year (e.g. videos and training slides) to build a training module on the Circular Economy.

4.2

COMMUNICATION

Circular Economy Events, Newsletter, and challenges

This is Enel X's quarterly newsletter dedicated to our Circular Economy progress to keep everyone up-to-date on **Enel X's CE activities**.

Website and Enel X Store

We believe our corporate website is one of our strongest communication tools. In fact, most of the content illustrated in this document can be found on the website in the "**Circular Economy**" section, which is content-rich with video tutorials and articles describing the CE Boosting Program, the CE Score, the CE Client Report and the CE Report for PAs. The CE Scores for a variety of products, which are also accessible from the e-commerce website, are accompanied by their bill of materials and their XRAY, which is an information sheet about a specific score that describes product performance and characteristics in relation to every CE business model.

Enel X Schools

Enel X has developed a project with schools in order **to involve young students in Circular Economy** issues and goals. The younger generations are at the center of the changes we want to make for our future and our environment. That's why Enel X is investing in reaching out to schools and educating youth about sustainability and environmental protection.

For collaborations and partnerships, contact us:

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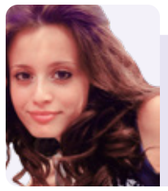

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