



# Circular Economy time of transition

## Siemens Business to Society

December 2020

Aalto University course, Sustainability in Environmental Engineering

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**Siemens Business to Society**

December 2020  
Aalto University course, Sustainability in Environmental Engineering

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**SIEMENS**

**Company Introduction**

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Our answers


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**SIEMENS**

## Group Work 1

What is your definition on Sustainability?  
CSR and Your expectation on Business?

Discussion in groups - 10 min



# Company Introduction



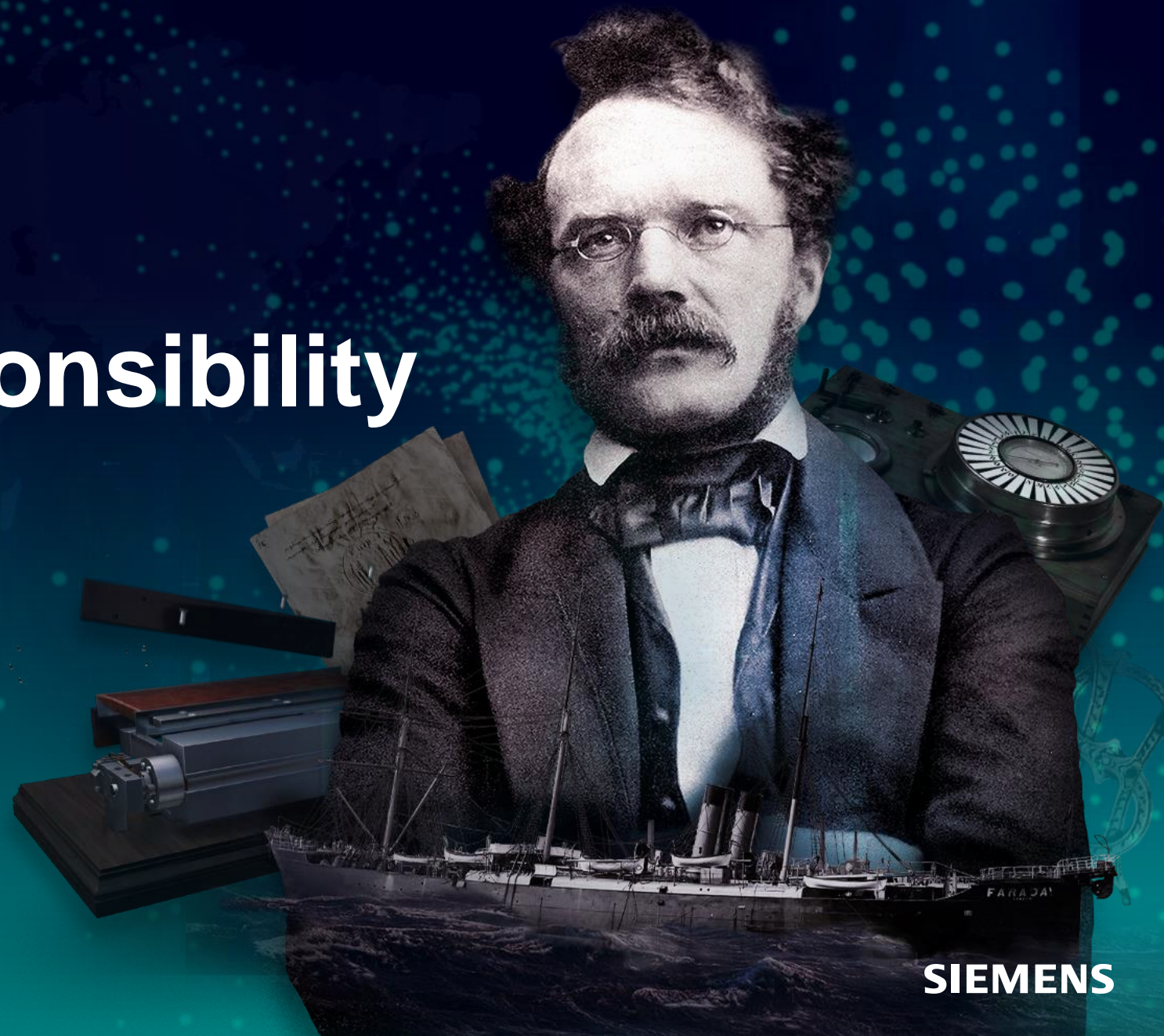
# More than 170 years ago

Siemens was founded on a powerful idea: a company should not only focus on maximizing profit. It should also serve society – with technologies, with its employment practices, with everything it does. This idea is still alive today. Serving society while doing successful and profitable business is at the heart of Siemens’ strategy. It’s our company’s ultimate purpose.”

– Joe Kaeser, President and CEO of Siemens AG



# 173 years of social responsibility





Natural catastrophes like wild fires or crises inflicted by pandemics such as Covid-19 will occur more frequently unless we stop depleting nature. New economic models offer resilience and competitiveness. We must play a key role in transitioning to a more sustainable, circular economy.

Judith Wiese, CHRO, Head of Sustainability and Member of the Managing Board of Siemens AG

# A powerful ecosystem



# Providing technology solutions to address the greatest challenges of our time

## Healthcare system

Aging society  
Personalized healthcare  
Affordable healthcare

Population growth  
Increase in chronic diseases

## Digital transformation of industry, infrastructure and mobility

Competitive industries  
Productivity

Efficient infrastructure  
Sustainable use of resources

Economic growth  
Prosperity

## Energy transition

Distributed energy systems / Grid edge  
Reliable supply  
Energy backbone for society

Increasing demand  
Energy efficiency  
Hydrogen / sector coupling

Climate change / decarbonization

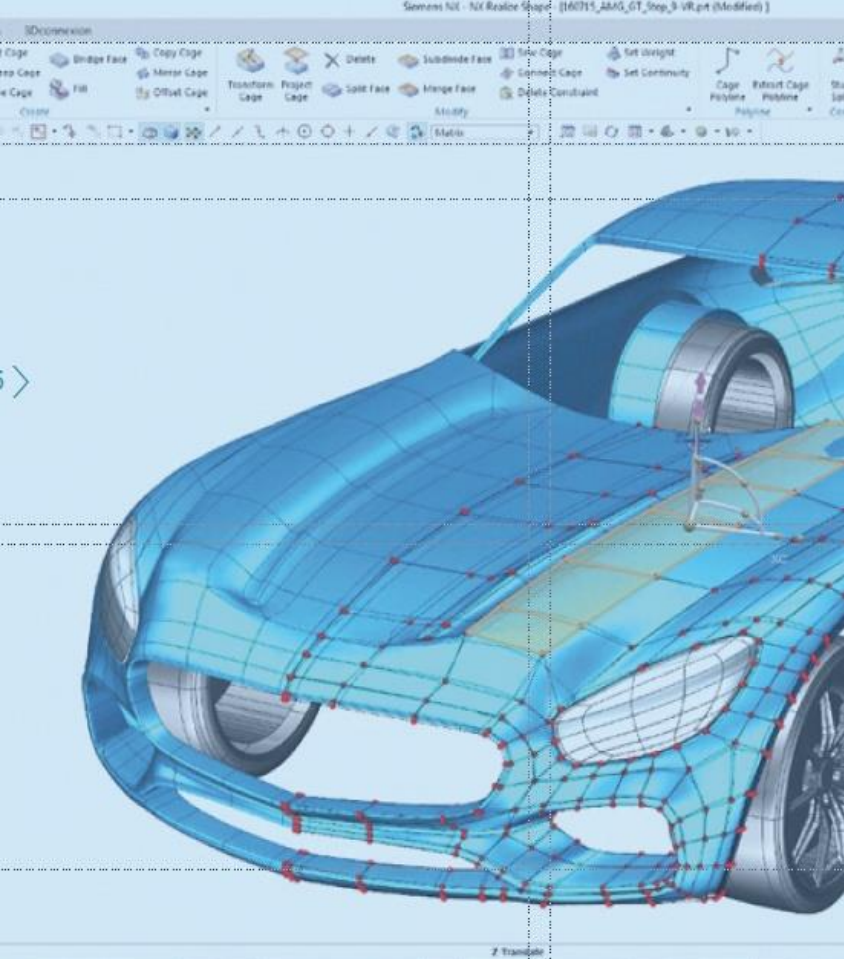
**Siemens**

**Siemens Healthineers<sup>1</sup>**

**Siemens Energy<sup>2</sup>**

<sup>1</sup> Publicly listed subsidiary of Siemens | <sup>2</sup> Publicly listed associate

# Technology to Transform the Everyday



We commute in cars designed with **Siemens software** ...

... built in factories running on **Siemens automation** ...

... charged by a renewable and decentralized **Siemens smart grid**.





We work in **smart buildings** that keep us comfortable and healthy ...

... with a **carbon neutral footprint** that keeps the planet healthy as well.





We travel on **Siemens trains** ...



... and on planes brought to life  
using **Siemens technology.**



We rely on **lifesaving drugs** sped to market ...



... thanks to **Siemens innovations.**

# Siemens in figures



As a leading technology company, we provide industry-specific support to our customers. That's what we do today and will do tomorrow.

**293,000**

employees<sup>1</sup>

**€57.1 bn**

in revenue<sup>2</sup>

**€4.2 bn**

in net income<sup>3</sup>

**14.3%**

adjusted EBITA margin  
for the Industrial  
Businesses<sup>2</sup>

<sup>1</sup> As of September 30, 2020 (excluding Siemens Energy) | <sup>2</sup> For fiscal 2020 (excluding Siemens Energy) | <sup>3</sup> Continuing and discontinued operations



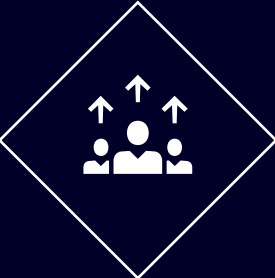
# Our four strategic priorities

## Customer impact



We're putting customer impact at the very center of Siemens.

## Empowered people



Siemens is driving progress through empowerment.

## Technology with purpose



Innovative technology has been at the core of Siemens for more than 170 years and it will remain at the core of the future we're building.

## Growth mindset



Being open to change, to new ways of working, always learning. Because being successful today does not guarantee success tomorrow.

# The 5 elements of our Ownership Culture

## Equity

Support long-term, output and profit orientation

## People orientation

- Empowerment and trust
- Honesty, openness and collaboration



## Values – our foundation

- Responsible
- Excellent
- Innovative

## Behaviors

- Respect
- Focus
- Initiative und execution

## Leadership

- Be bold, decisive and courageous
- Exemplify "Siemens matters"
- Motivate and engage

**Siemens is shaping  
the future**



€4.6 bn

R&D expenditures<sup>1</sup>

40,700

R&D employees<sup>2</sup>

## Ingenuity drives innovation

5,120

Inventions<sup>3</sup>

2,740

Patent applications<sup>3</sup>

## Cooperation

with universities

8

CKI universities<sup>4</sup>

17

Principal partner universities

<sup>1</sup> In fiscal 2020 (without Siemens Energy) |

<sup>2</sup> On average during fiscal year 2020 (without Siemens Energy) |

<sup>3</sup> In fiscal 2020 (without Siemens Energy) |

<sup>4</sup> Centers of Knowledge Interchange





# Employer with vision

293,000  
people worldwide  
work for Siemens

~32,000  
New hires  
worldwide

~4,600  
new hires in  
Germany

6,800  
Apprentices and  
students in work-  
study programs

As of September 30, 2020 (excluding Siemens Energy)

**SIEMENS**



Employer with vision

# Zero Harm Culture

Our **Zero Harm Culture@Siemens** program follows three principles:

**Zero incidents – it's achievable!**

**We take care of each other!**

**No compromises on health and safety!**

Our employees are our greatest asset. That's why we want every single Siemens employee to be able to rely on a safe working environment at all times.





Our contribution to society

## Compliance

### Highest rankings

in Dow Jones Sustainability Index in the category  
“Compliance” since 2009

---

>US\$100 m

to support organizations and projects  
fighting corruption and fraud

---

>350,000

web-based Compliance trainings of  
employees each year, averaged



# Mobile working

as a key element of the “new normal”

Mobile working **two to three days a week** will be a worldwide standard

For about **140,000 employees<sup>1</sup>** at more than **125 locations** in **43 countries**

The New Normal Working Model will enable employees to choose – following consultation – to work wherever they can be most productive. This change also accommodates the employees’ desire for more flexibility and personalized approaches when it comes to choosing where they work.

<sup>1</sup> Number of job profiles that are suitable for mobile working.

# | Global EHS Program

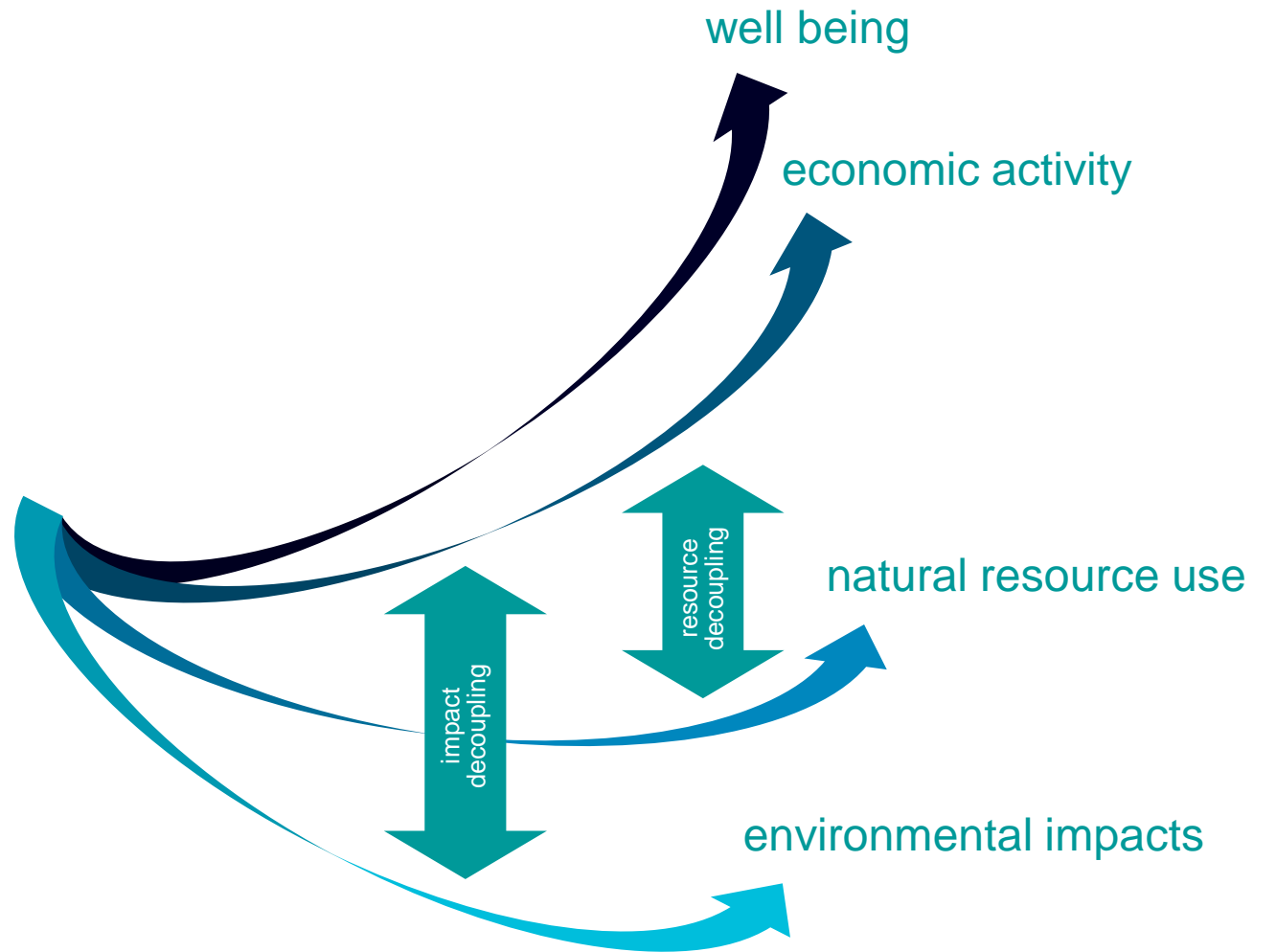
Eco Efficiency @ Siemens



Eco Efficiency@Siemens  
**integral module  
of the new  
EHS program**



Eco Efficiency @ Siemens  
creates solutions  
for sustainable growth  
by decoupling  
natural resource utilization  
from environmental impacts



# Our solutions to generate sustainable growth

## Responsible Product Development i



- Robust eco design criteria
- Measurable eco satisfaction

→ *Sell eco efficient products and solutions*

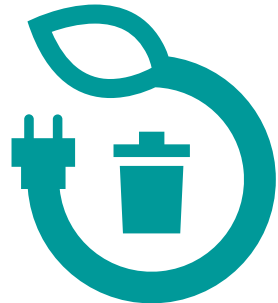
## Clean Supply Chain i



- More secondary materials
- Less substances of concern

→ *Build a clean supply chain*

## Efficient Own Operations i



- Effective energy management
- Enhanced waste management

→ *Run low-emission production and offices*



# A view on Circular Economy





Earth functions in cycles in a closed system with natural limits of resources.

Sustainable societal and industrial models respect the cycles of earth.

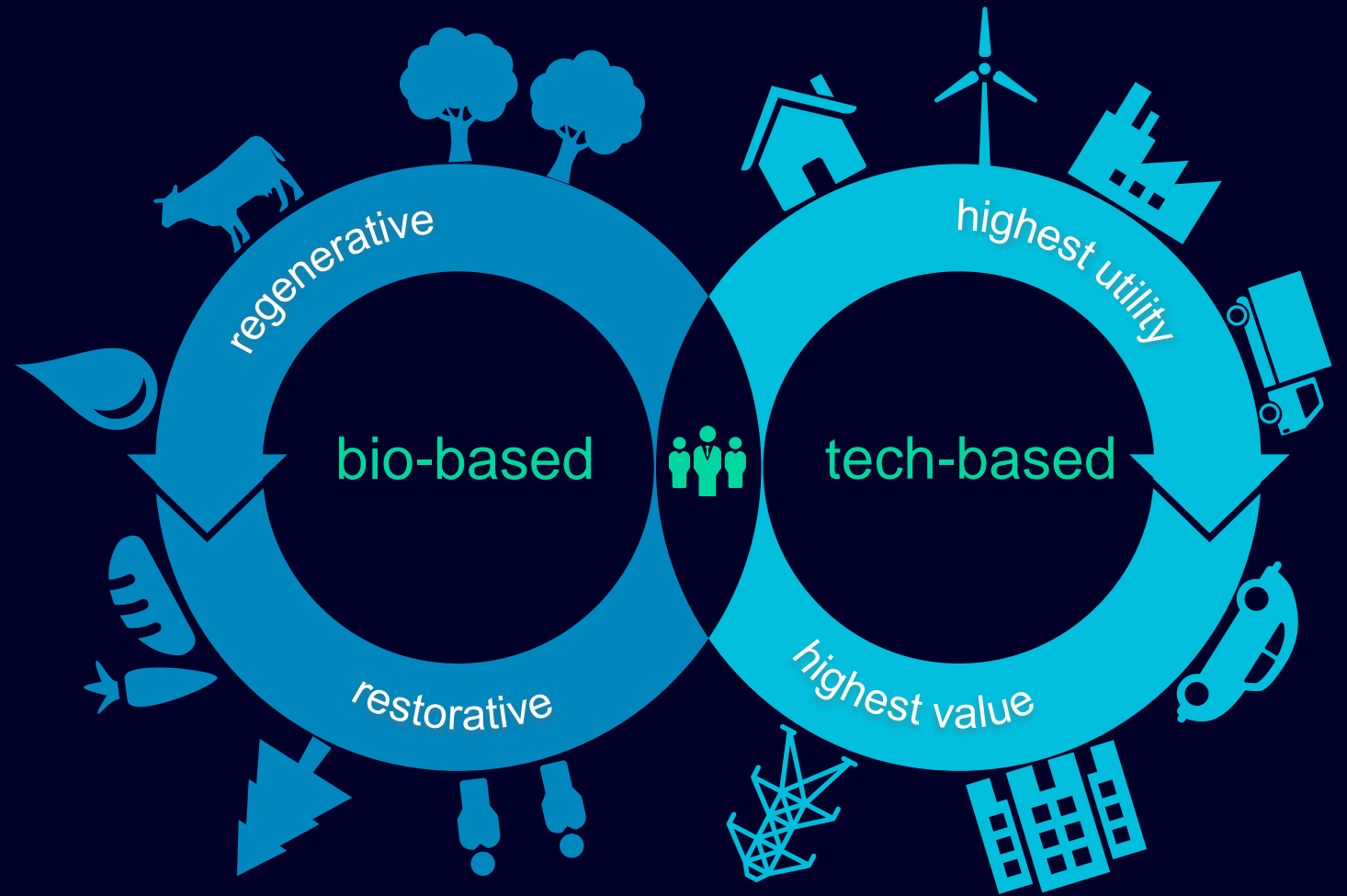
Dominant linear take make waste economies exhaust the natural cycles.

Circular economies offer sustainable solutions for rising population & nature.





# Circular Economy a conceptual umbrella framework



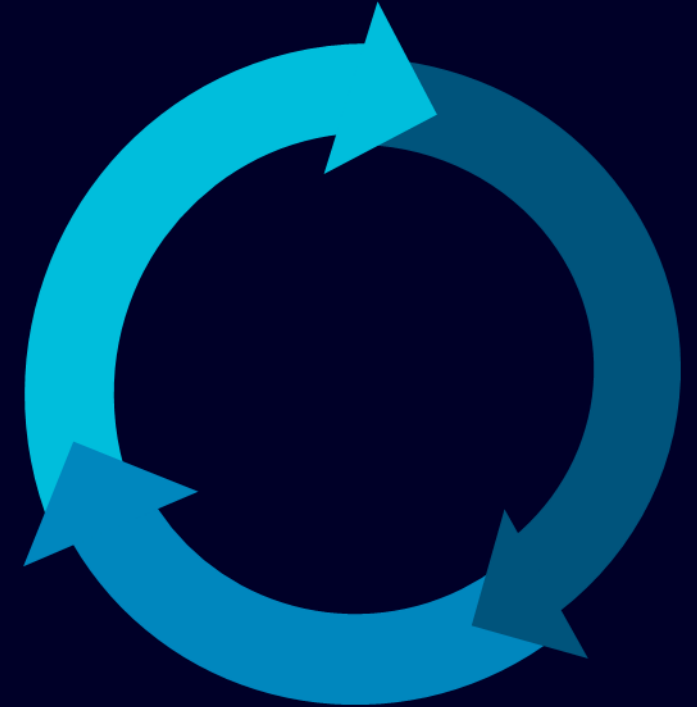
# Circular business models and principles get introduced

## Business models

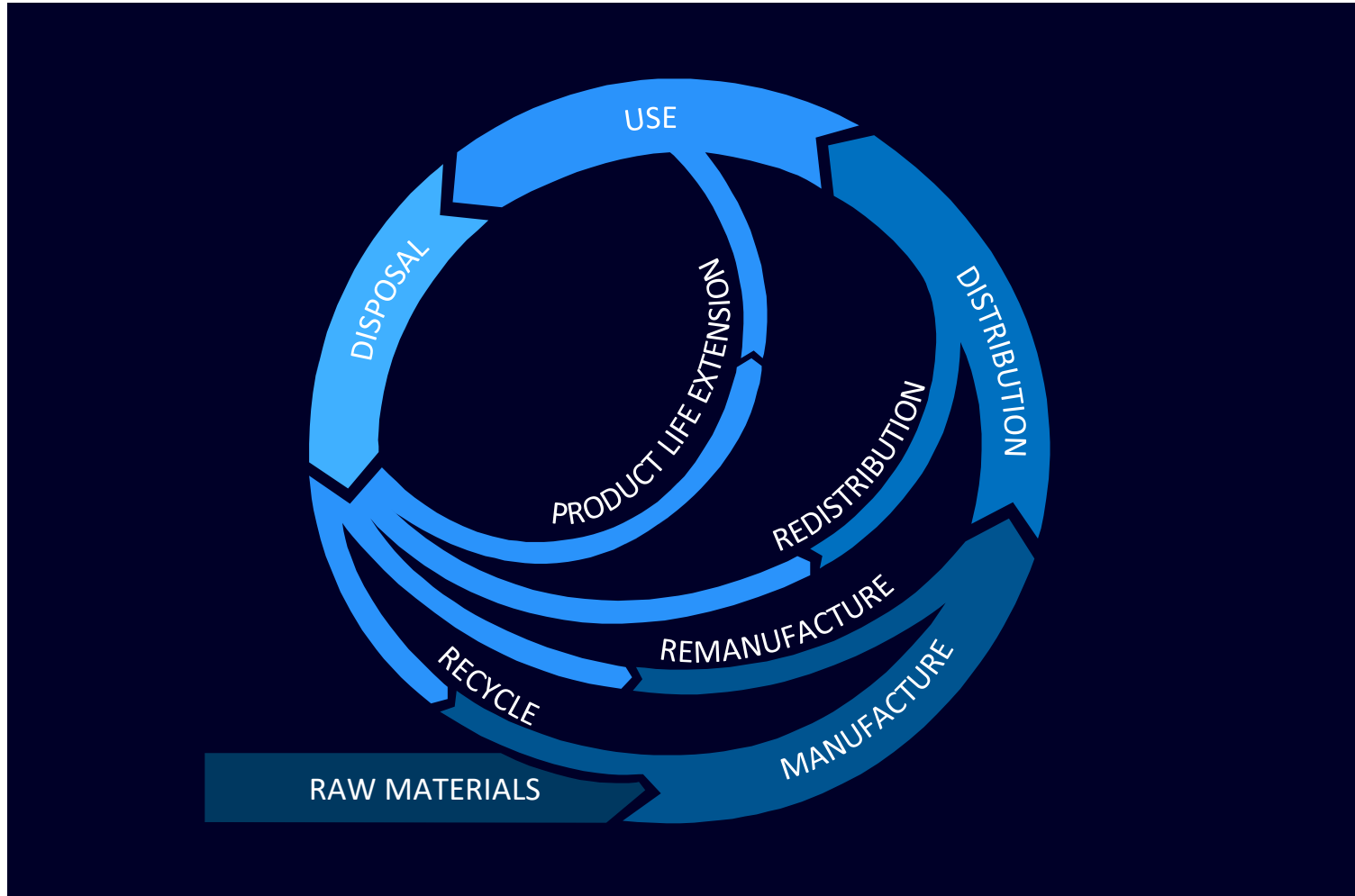
- product as a service model
- life span models
- platform models
- circular input models
- waste value models

## Principles

- less substances of concern
- more recycled materials
- maximized product use
- recovered byproducts
- collaborative value chains



# Challenging but also beneficial Implementing Circular Economy



## Challenges

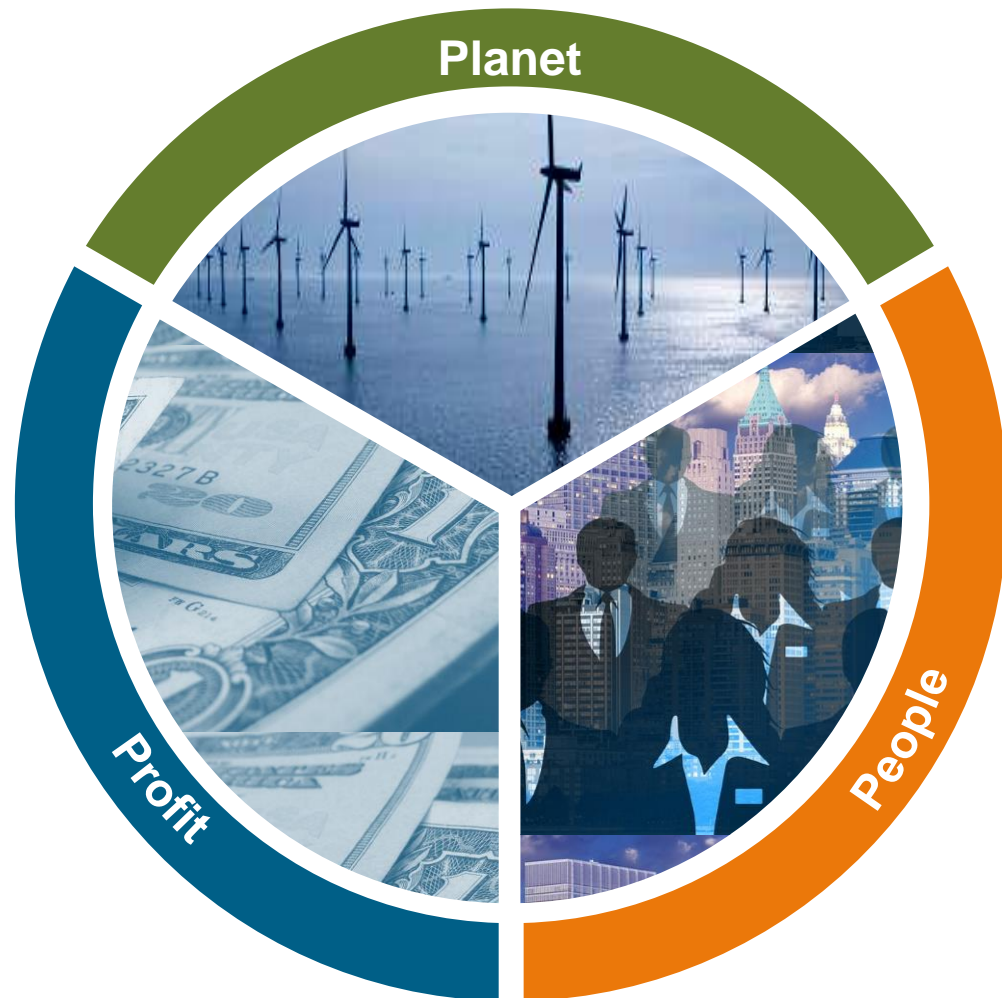
- overcoming rebound effects
- balancing out sustainability focus
- linking value chains to cooperation
- abandoning human habits

## Benefits

- reducing environmental pressure
- creating jobs
- increasing competitiveness
- boosting economic growth



# Sustainability at Siemens aims to optimize the impact of our business activities on a global level



Sustainable development is the means to achieve profitable and long-term growth.

At Siemens we have a clear commitment to think and act in the interest of future generations, balancing **People, Planet** and **Profit**.

# Environment

Siemens' direct contribution to decarbonization is to be CO<sub>2</sub>-neutral by 2030



## Levers for CO<sub>2</sub>-neutral Siemens

Drive Energy Efficiency Program



Leverage Distributed Energy Systems



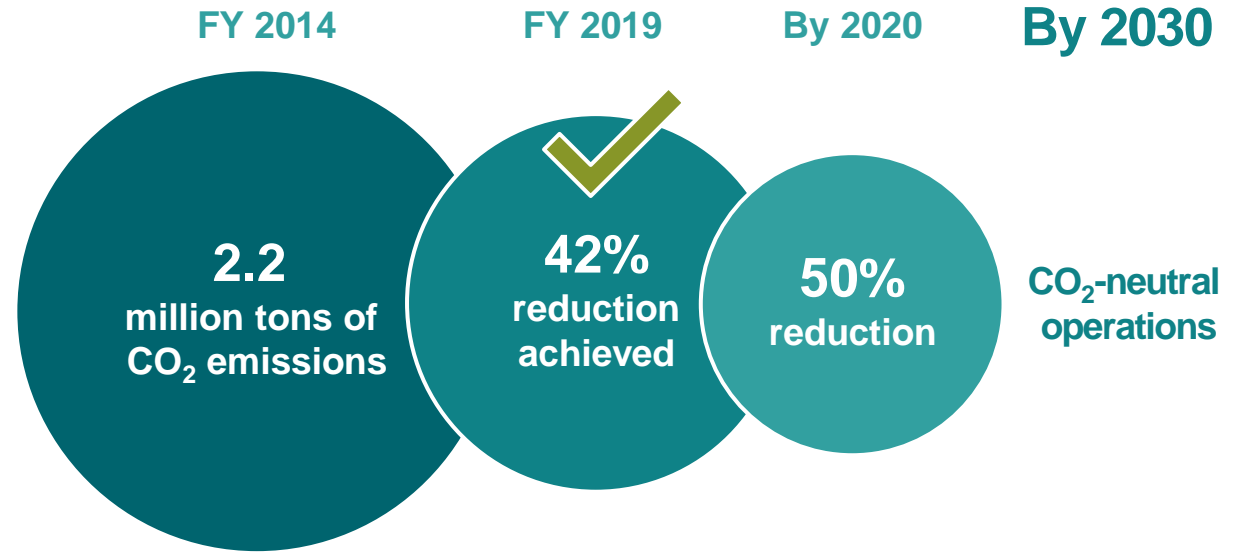
Reduce Fleet emissions



Purchase Green Energy



## CO<sub>2</sub>-reduction on track



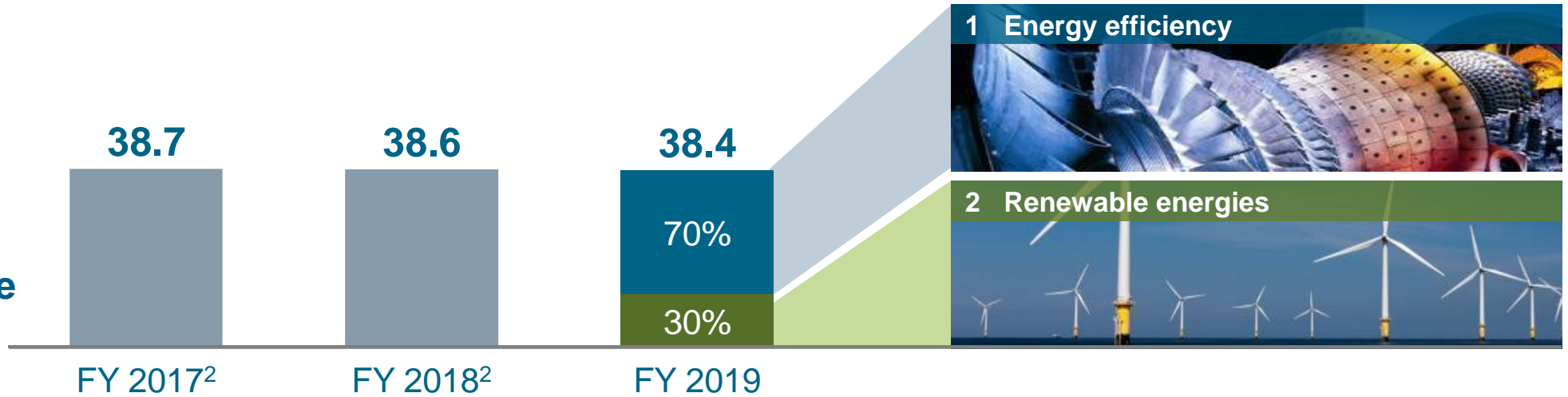
Annual savings from Energy Efficiency projects add up to at least **€20 million**

Siemens invests more than **€100 million** to reduce the company's own carbon emissions and become one of the world's **first CO<sub>2</sub>-neutral industrial companies by 2030**

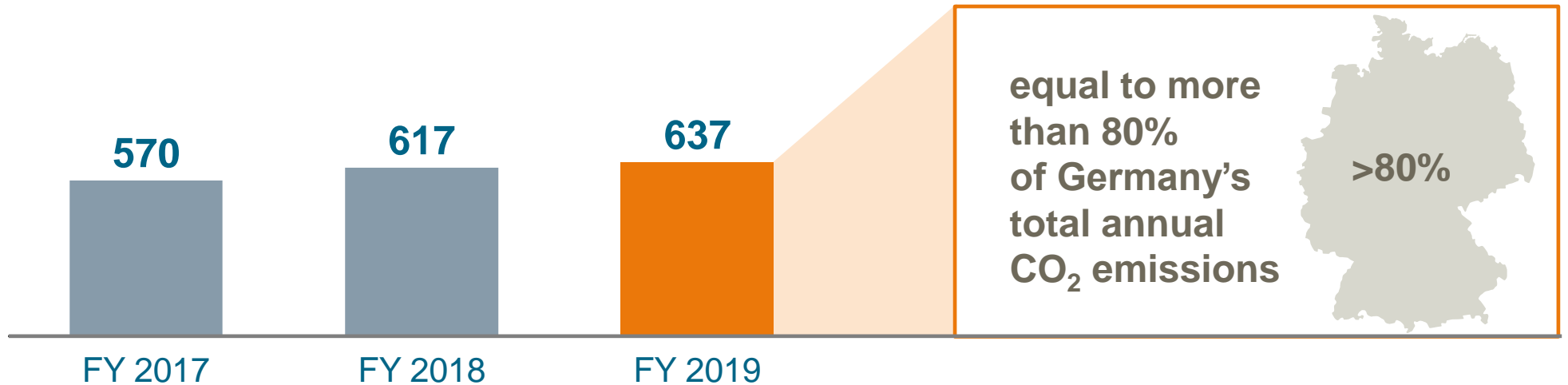
# Environment

## Our biggest lever toward decarbonization is the Siemens Environmental Portfolio

**Environmental Portfolio revenue**  
(in billions of €)<sup>1</sup>



**Environmental Portfolio CO<sub>2</sub> abatement**  
(in millions of metric tons)<sup>1</sup>



1) On a comparable basis 2) Includes elements which are not covered anymore in EP (comparable FY18 EP revenue 37.6 billions of €)


# Key Sustainability figures FY19

**SIEMENS**  
*Ingenuity for life*


Our Environmental Portfolio is worth **€38bn**



We help our customers reduce **637** mio tons of CO<sub>2</sub> emissions




**€100** mio will be invested until 2020 in internal energy efficiency measures to become CO<sub>2</sub>-neutral by 2030




**>10,000** apprentices world-wide as part of our dual education program



**>1000** supplier quality audits




**24%** proportion of women of total employees




**55** anti-corruption projects in 40 countries worth > US\$ 70 mio



**>€500** mio invested in training and education of employees



**90,000** suppliers committed to Siemens supplier code of conduct




**6.5%** R&D intensity of total Siemens revenue



**~65,000** granted patents



**~90%** of waste recycling rate





# | Stakeholders

Static snapshot

The logo for Greenpeace, featuring the word "GREENPEACE" in a stylized, green, sans-serif font.

International Union for Conservation of Nature and  
Natural Resources (IUCN)



Societies / NGO

**question current  
business practices  
and call companies  
to walk the talk**



Governments  
**start to shape the  
market framework  
for a sustainable  
recovery**



Investors

**see the increasing importance of sustainable investments**



# Customers, investors and media expect detailed information on our **SIEMENS** performance – we publicly disclose it in our Sustainability Information *Ingenuity for Life*



## Legal Requirements

Regulations increasing – CSR RUG

## Market/Customer requirements

Customers qualify and short-list Siemens as a supplier by our sustainability performance

## Investor requirements

ESG<sup>1)</sup> transparency is acknowledged by investors and rating agencies

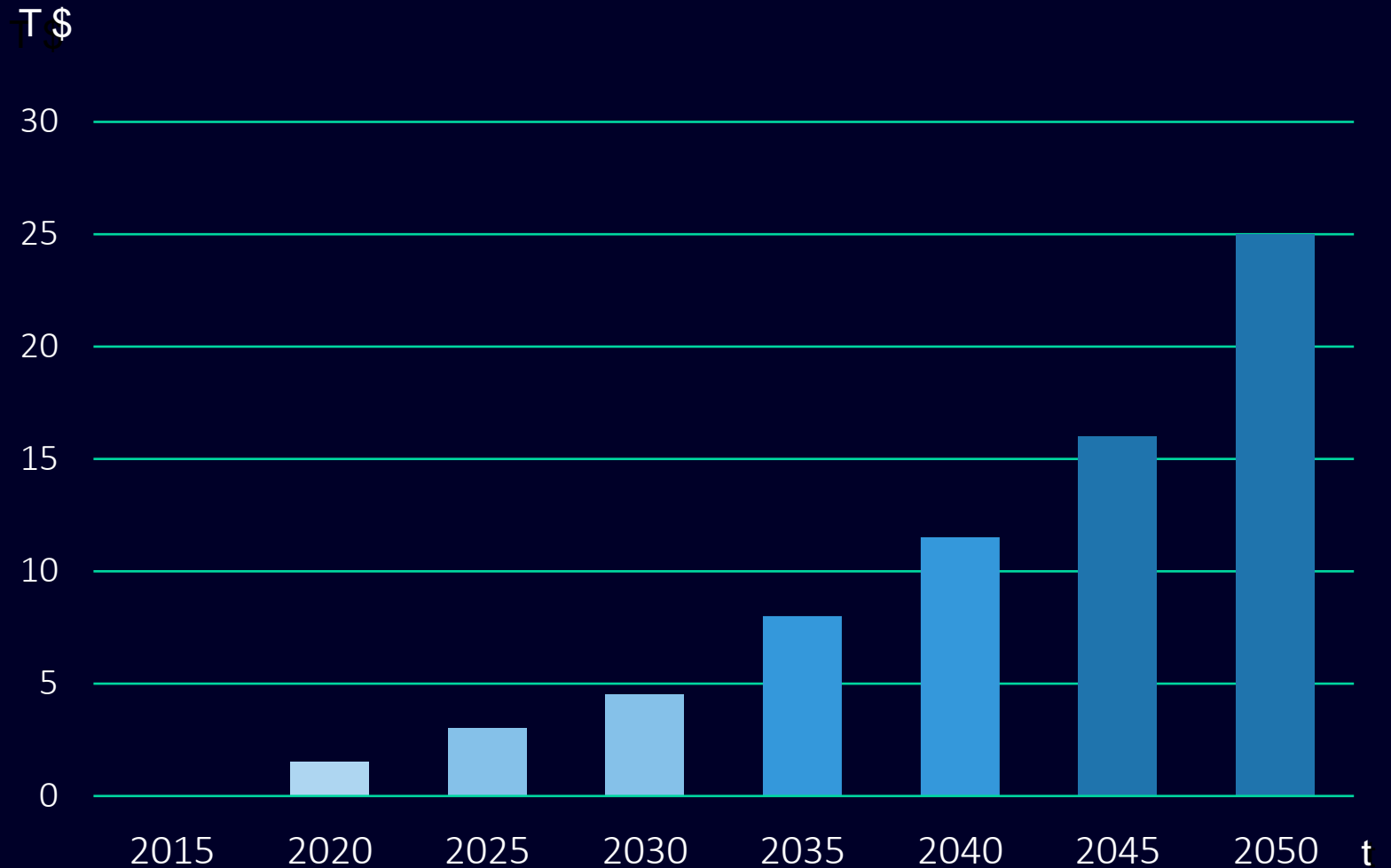
## Safeguarding Siemens Brand

Responsible business practices are externally acknowledged

# Siemens Impact in Finland

Footprint vs. Handprint

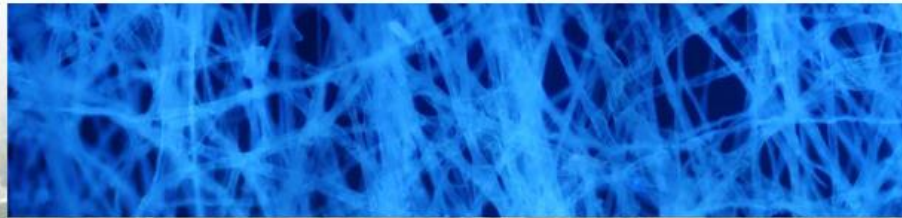
\$ 25.0 trillion  
in new circular  
economic growth  
by 2050



Source: Accenture (2015)<sup>5)</sup>

# ÖSTERSUNDOM BIO-INTEGRATE

## THE BIOINTEGRATE: FUTURE ECOSYSTEM



27



# Five business models reduce the inefficiencies and create value for companies

Reform use of resources

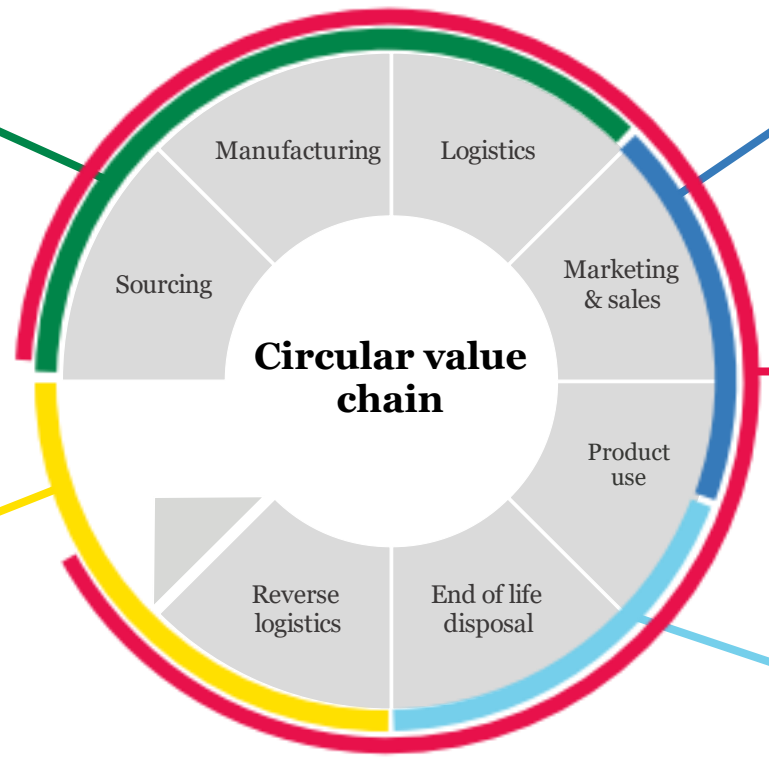
## CIRCULAR SUPPLY CHAIN

Use of renewable energy, bio-based or potentially completely recyclable materials

Recover value in waste

## RECOVERY & RECYCLING

Recovery of usable resources or energy from waste or by-products



Optimise capacity use

## SHARING PLATFORM

Increased usage rates through collaborative models for usage, access, or ownership

Offer outcome oriented solutions

## PRODUCT AS A SERVICE

Offering of products for use with retention of product ownership which incentivises increase in resource productivity along the whole life cycle

Extend life cycles

## PRODUCT LIFE EXTENSION

Extension of the life cycle through repair, maintenance, upgrading, resale and remanufacturing

Source: Accenture, Appendix 2 for more details

### Did you know?

On the Circular Economy site, there is an exercise package called **Business model development toolkit**, where you can analyse the relevance of each circular business model for your company.

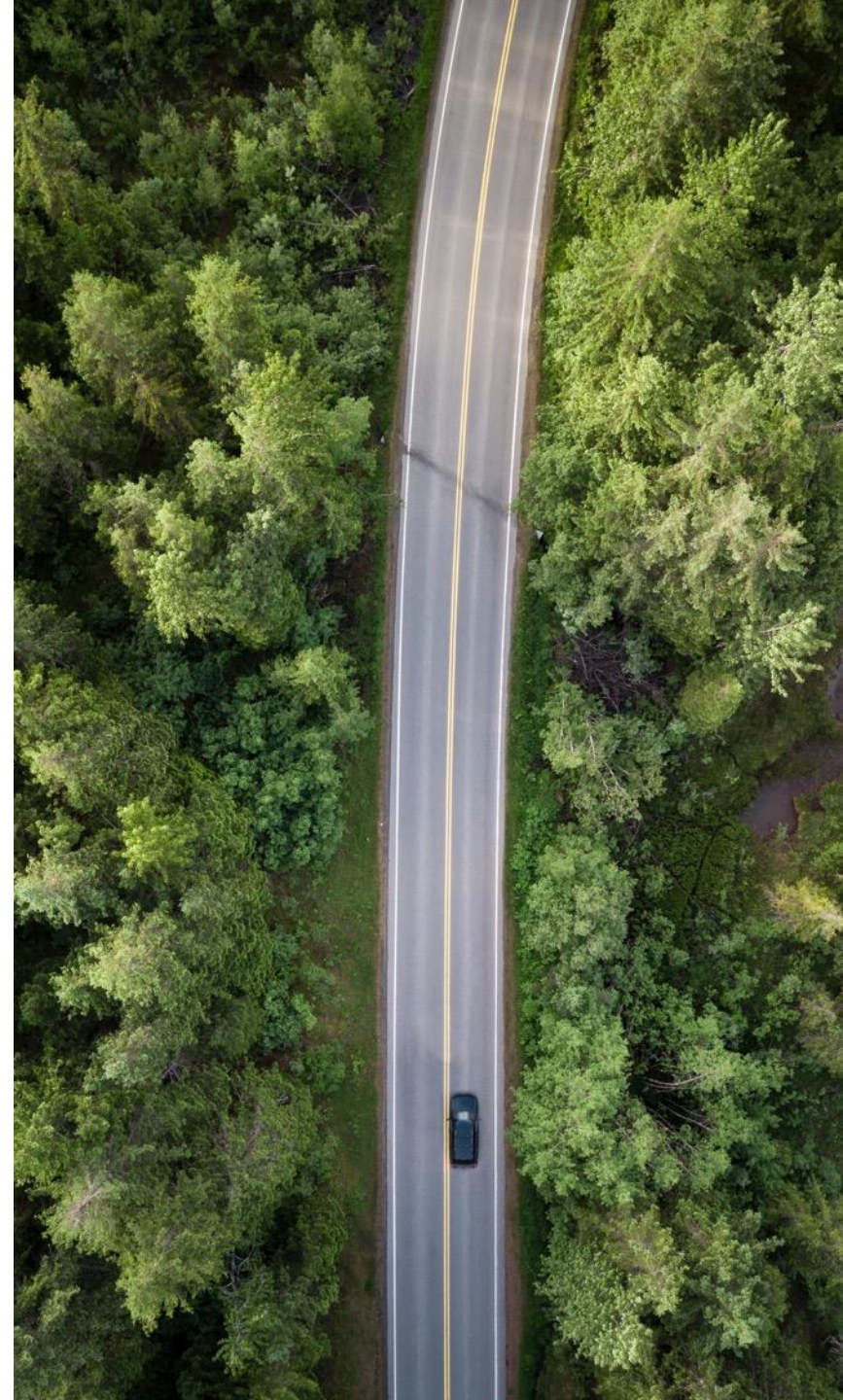




**SIEMENS**  
*Ingenuity for life*

# VALUE HACKER.

Creates business value.







## Reference Nestlé, Juuka, Finland

*Juuka digitalization showcase will act*

*as a global best practice model for  
Siemens / Nestlé cooperation*

Peter Suess, Chief Engineer, Nestlé

# Reference Nestlé, Juuka, Finland – Customer challenges and benefits

## Challenges

- Increase transparency of manufacturing process process, in order to increase quality and performance to the next level
- Improve competitiveness and profitability with reduced cost-of-production
- Solution for Closed Loop Manufacturing including Plant Simulation, TIA Portal, Preactor Scheduling and MindSphere IIoT
- Need for an automatic and transparent production environment that enables continuous development

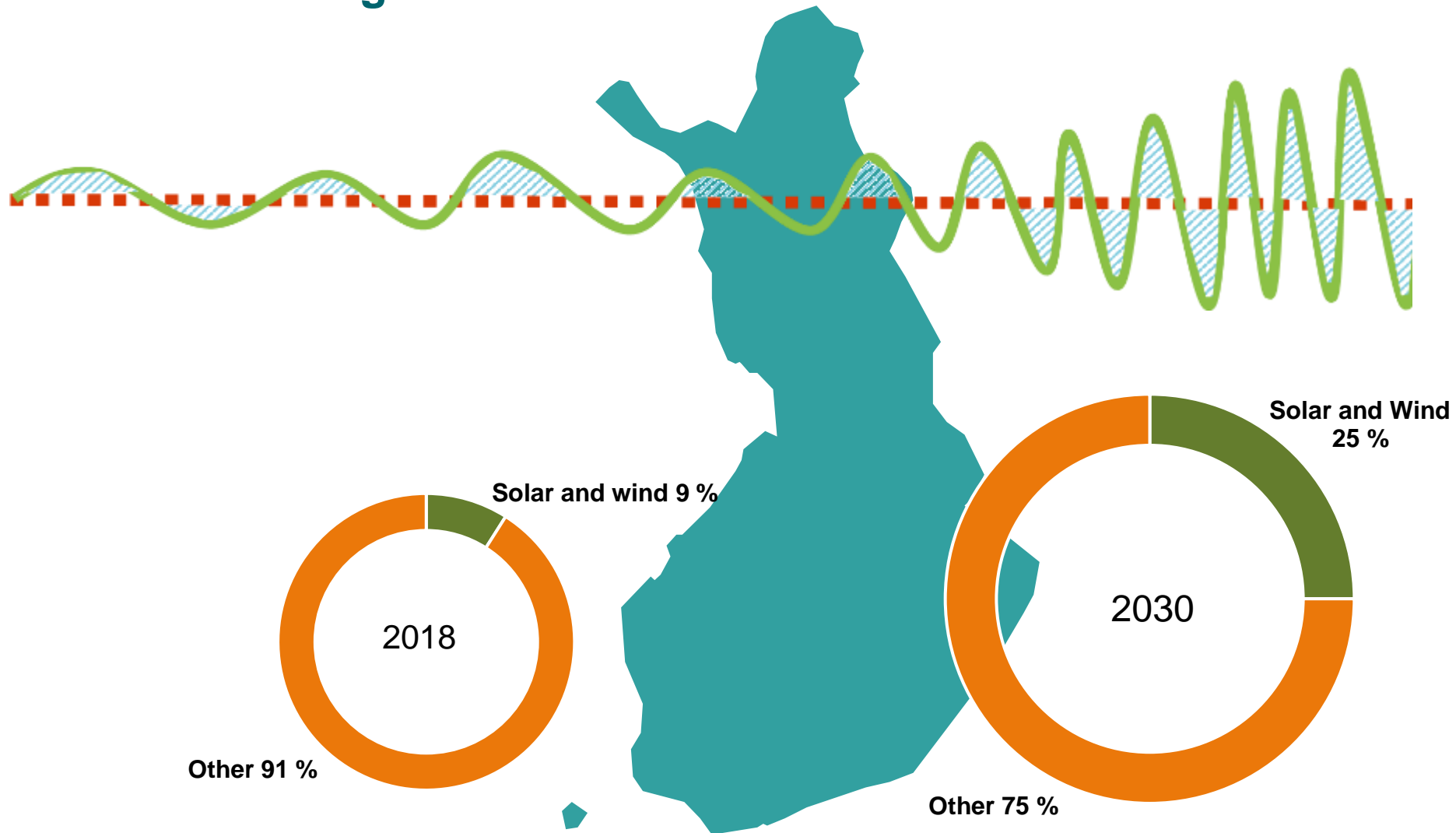
## Benefits

- Production transparency
- Increased productivity
- Performance-based service contract and collaborative approach with Siemens experts (less risk, shared benefit)



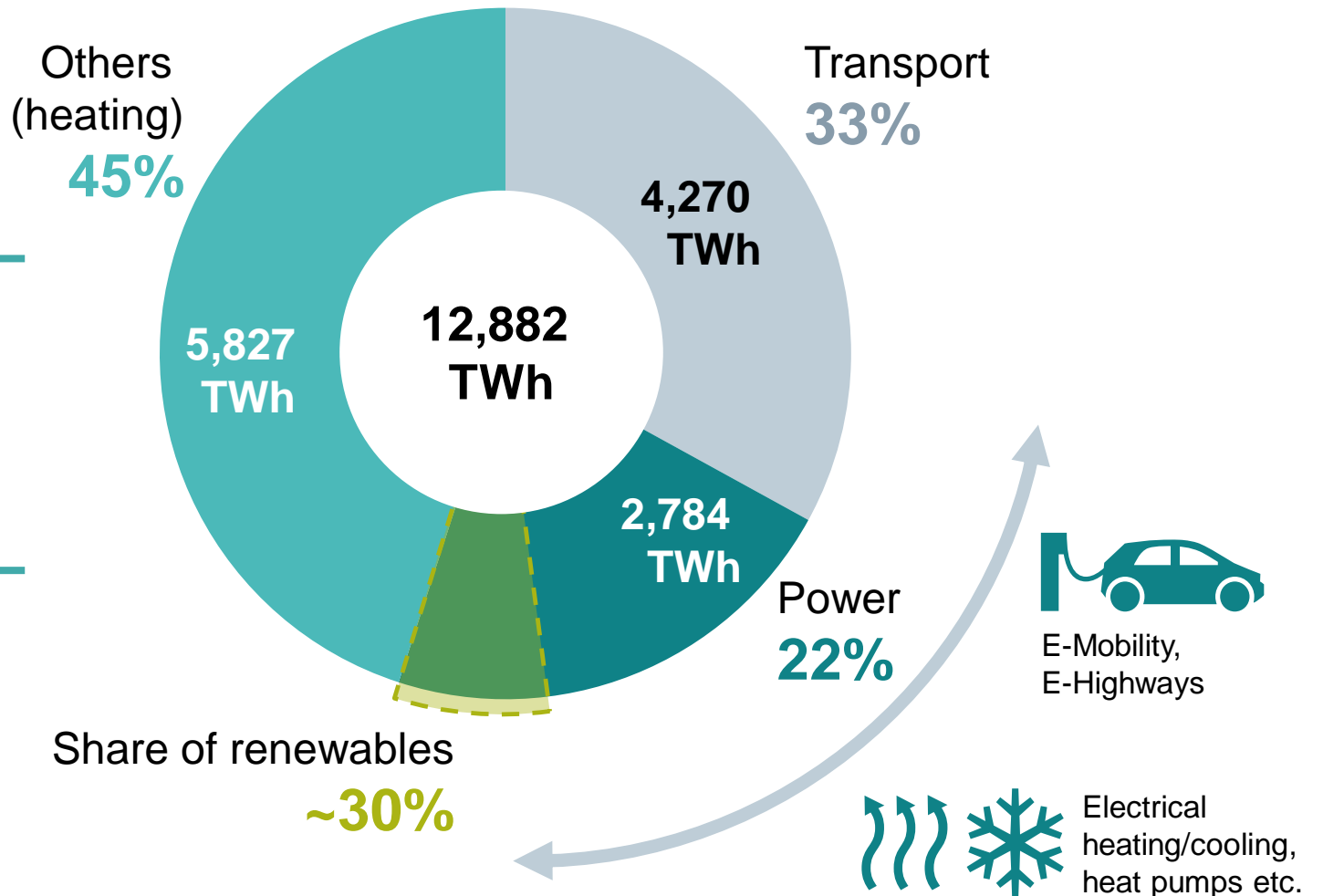
# Energy system will become more volatile

## How to balance the grid?



# Growing need for Flexibility in the power system – Electricity production will triple and will be by renewables

Final energy consumption EU28 in 2016



Source: eurostat



Actively regulates energy consumption by purchasing, storing and consuming electricity based on market price and needs

- The largest shopping mall in Finland
- 100.000 m2 of shopping space
- 23 Million visitors per year
- 170 Shops
- LEED Platinum



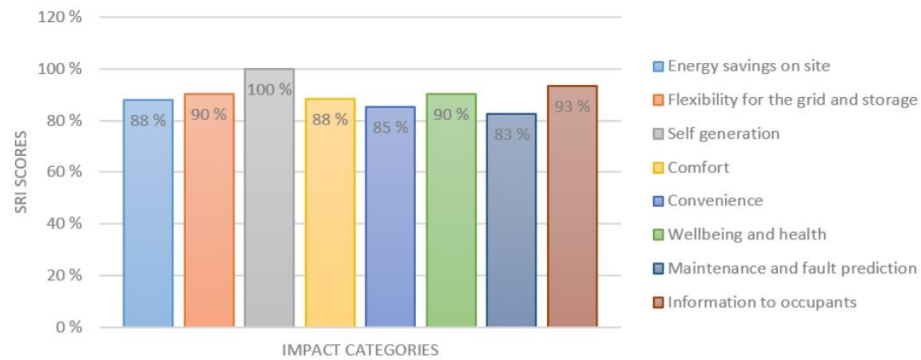
- Energy efficiency
- Optimization of peak loads
- Own electricity production
- Totally new income from reserve markets

## Sello Shopping centre, Finland

- New earning model
- Reduces consumption for a moment and thereby balancing the load in the grid
- Solutions for automatic purchase and selling of electricity as well as controlling of consumption
- Diversified know-how: building automation, microgrids, connectivity, platforms, digital solutions, energy storages, smart metering, local production, financing

# Smart Readiness Indicator (SRI)

SRI SCORES BY IMPACT CATEGORIES



SRI SCORES BY DOMAINS



N/A - Category/domain is not assessed, because of irrelevance

## Sello

SRI score

# 92%



Design by Laura Remes





Sello Shopping Center



VR Group



City of Lappeenranta



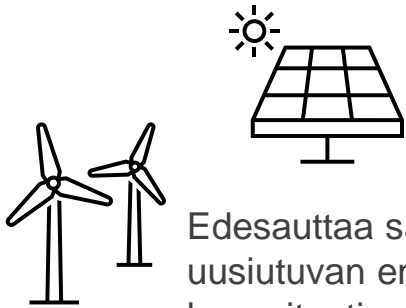
Ski resort, Levi

Forerunners for  
creating sustainable  
future.

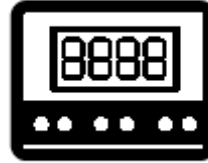


Goodman  
Shopping Center

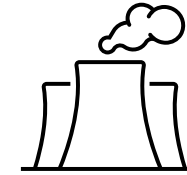
# Case 2: Kysyntäjouston ja akkupaketin kädenjälki per MW *g a i a*



Edesauttaa sääriippuvaisen uusiutuvan energian kapasiteetin sovittamista sähköverkkoon. 1 MW uusiutuvaa energiaa vähentää päästöjä noin **144 tCO<sub>2</sub>e** vuodessa\*



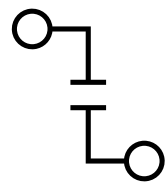
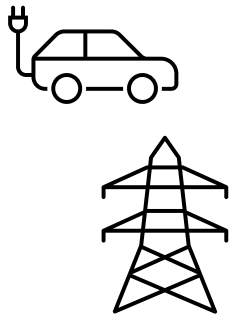
Vähentää tarvetta tasapainottaa sähköjärjestelmää fossiilisella säätövoimalla, mikä säästää noin **40 tCO<sub>2</sub>e** vuodessa.\*\*



Mahdollistaa siirtymän kohti päästötöntä sähköjärjestelmää pienemmällä määrällä fossiilista varavoimaa, mikä leikkaa noin **500 tCO<sub>2</sub>e** päästöjä ja **400 k€** investointi- ja polttoainekustannuksia 20 vuoden aikana\*\*\*.



Suoria vaikutuksia huomattavasti suurempi on kysyntäjouston merkitys päästöttömän energiajärjestelmän mahdollistajana järkevällä siirto- ja varavoimakapasiteetilla. Sähkön kysyntäjouston avainrooli korostuu entisestään lämmitys- ja liikennesektoreiden sähköistyessä.



Estää sähkökatkoksia teollisuudessa, jossa yhden odottamattoman keskeytyksen haitta on keskimäärin **2 000 – 5 000 € / MW \*\*\*\*** (ml. alle sekunnin mittaiset katkot)

\* Tilastokeskus sähkön hiilidioksidipäästö 144g/kWh (hyödynjakomenetelmä)

\*\* Oletuksena, että akkukapasiteettia tarjotaan FCR-N markkinoille, jossa fossiilisen lämmön ja sähkön yhteistuotannon osuudeksi on oletettu 20% (Fingrid 2018: Vesivoiman rooli sähköjärjestelmän tuotannon ja kulutuksen tasapainottamisessa) Akkukapasiteetilla korvataan 1 MW tuotannon ylössäätöä yhteensä tuhattena tuntina vuodessa. Yhteensä ylössäätötunteja FCR-N markkinoilla on noin 4 400), joten ko. kapasiteetin oletetaan osallistuvan ¼ mahdollisista ylössäädöistä.

\*\*\* Oletettu 30h vuotuinen käyttöaika kevyellä polttoöljyllä toimivalle varavoimalle Fingridin Forssan laitoksen perusteella

\*\*\*\* Perustuu Silvast et al. (2005): Sähkönjakelun keskeytyksestä aiheutuva haitta sekä Mäkinen et al. (2009): Sähkönsiirtoverkon häiriökeskeytysten aiheuttaman haitan arvioinnissa käytettävien parametrien päivittäminen.

## Group Work 2

Discussion on Company handprint vs operational footprint.  
What should be optimized?

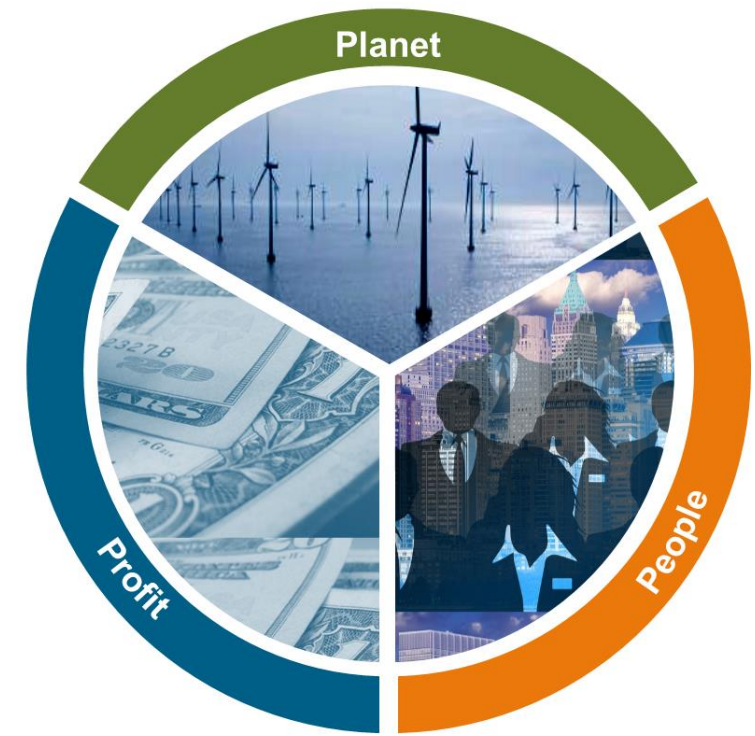
Discussion in groups - 10 min



# Siemens Business to Society

Our answers





# UN Agenda 2030: 17 Sustainable Development Goals to transform our world

Sustainability at Siemens aims to optimize the impact of our business activities on a global level

# Changing business environment requires new thinking about growth & business success

Siemens is **contributing significantly to sustainable development** through ...



# With our Business to Society methodology, we assess contribution towards the UN's Sustainable Development Goals.



**SIEMENS**

Our mission:  
We make real  
what matters.



Strengthening the Economy



Developing local Jobs and Skills



Driving Innovations



Sustaining the Environment



Improving Quality of Life



Shaping Societal Transformation



# Business to Society approach in Finland



**Global objective**  
UN Sustainable Development Goals

**Finland Agenda 2050**

**Implementation in Finland**  
Government Action Plan

**Business to Society -program**

**Siemens Impact on**  
**What Matters in Finland**



# Individual Work 3

Where is Siemens contributing most / least on UN SDGs?  
Prioritize TOP 5 with highest impact and Bottom 5 with least impact.

Individual task in Zoom Poll - 5 min



# Our business activities contribute to the SDGs via four levers

We have prioritized the SDGs according to our impact

Siemens is **contributing significantly to sustainable development** through ...



## High impact

...mainly via our products & solutions and thought leadership



## Medium impact

.... mainly via the way we do business (enabling SDGs)



## Low impact

.....limited and often indirect via cooperations



# | Contact

**Lars Maura**

Head of Business Development  
Sustainability Officer

Siemens Osakeyhtiö

**Mobile +358 50 567 1677**

**E-mail [lars.maura@siemens.com](mailto:lars.maura@siemens.com)**

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**<https://new.siemens.com/fi/fi/yhtio/ajankohtaiset-teemat/kestavakehitys.html>**