

Capital Markets Day

Capture growth in balancing solutions and services

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November 18, 2021

Capture growth in balancing solutions and services

Significant value creation opportunity as the transition to renewables accelerates

Leading position in thermal balancing, energy storage and power system optimisation

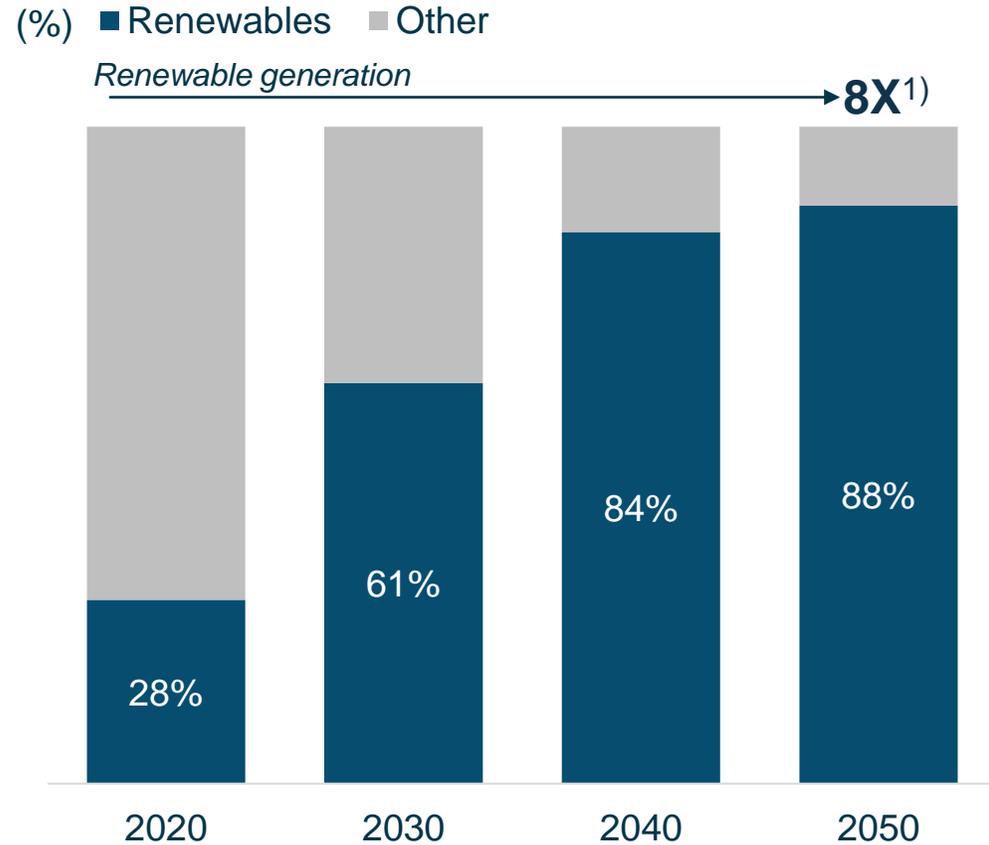
Set for performance through services growth and project excellence



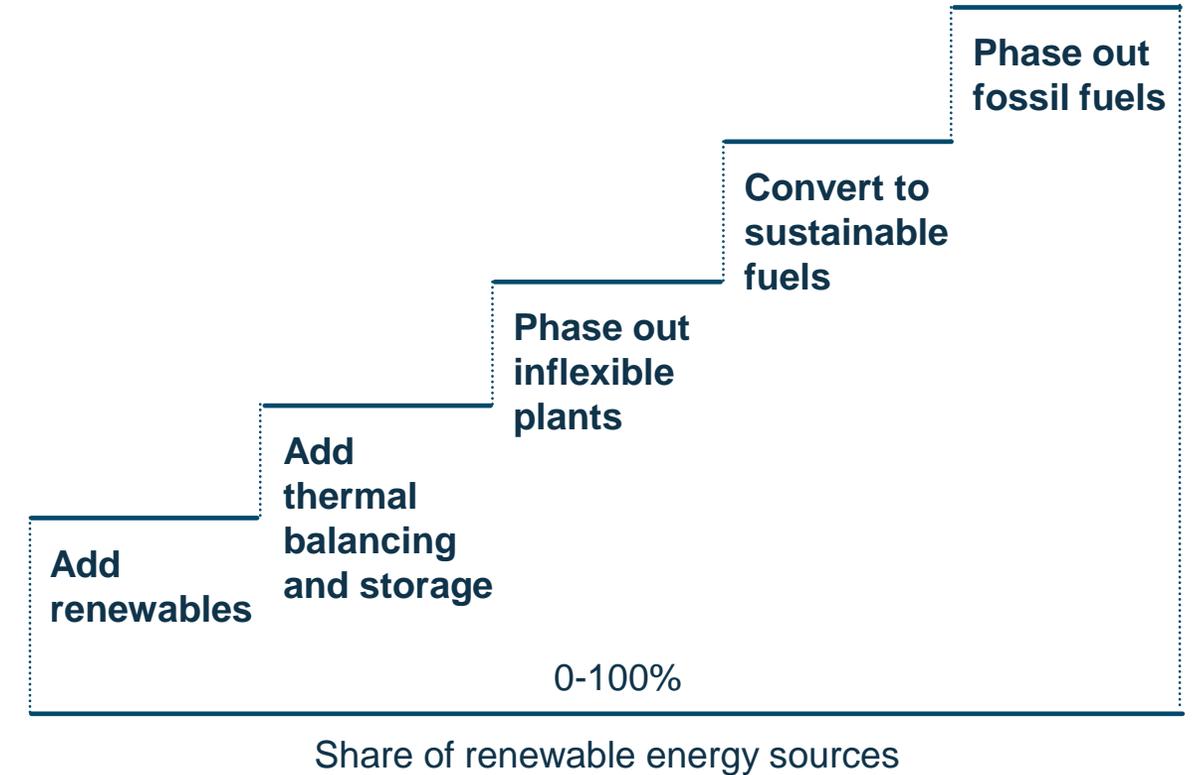
Transform – The future is renewable

The energy future is renewable – balancing solutions are needed to achieve net zero by 2050

Share of renewables in global electricity generation



Key steps to achieve net zero



Source: IEA World Energy Outlook 2021 (Net Zero Emissions Scenario)



Power system optimisation - Day

On sunny and windy days, renewables provide most of the electricity and excess energy can be stored.



Weather

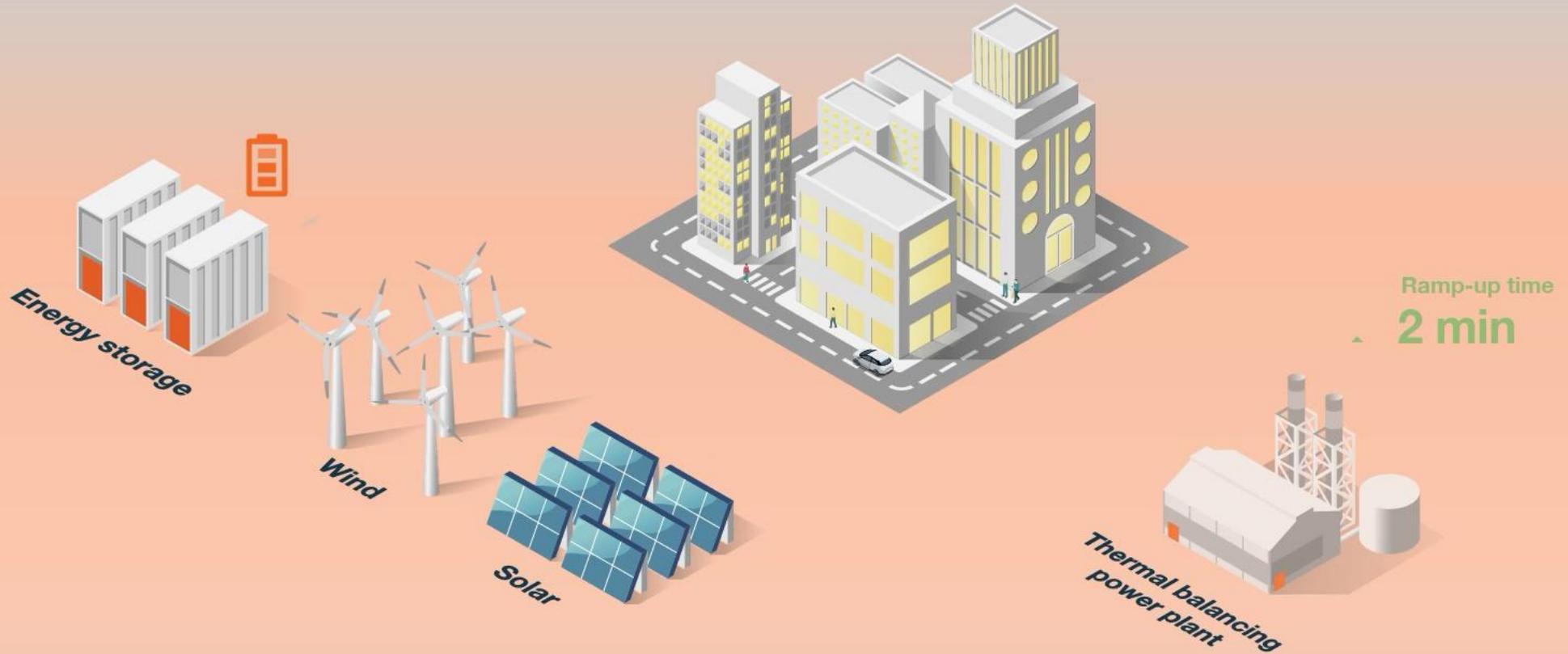


Electricity demand



Power system optimisation - Evening

Electricity demand is at its highest. When the sun goes down, quick ramp up of balancing power is needed.





Power system optimisation – Night

No wind and empty batteries, thermal balancing provides electricity.



Ramp-up time
10-45 min

vs.

2 min



Power system optimisation – Night



Wind starts blowing, engine can be switched off quickly compared to inflexible sources.



Turbine power plant

Ramp down time
10-45 min

vs.

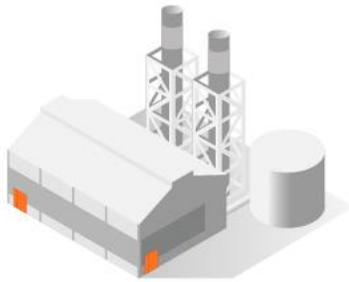
2 min



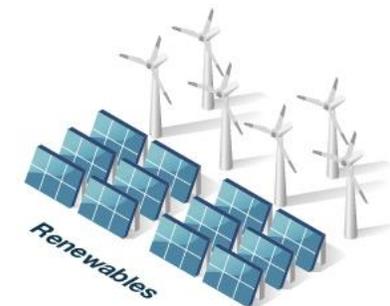
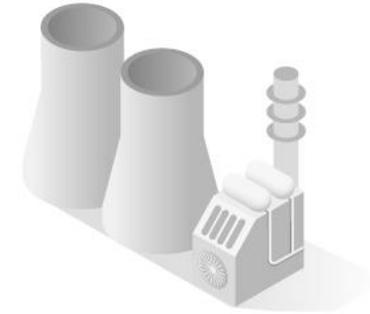
Thermal balancing power plant

The 3 Cs - Our balancing solutions are complementary and provide: Reduction in CO_2 , *Curtailement* and *Capex*

Optimal system with thermal balancing



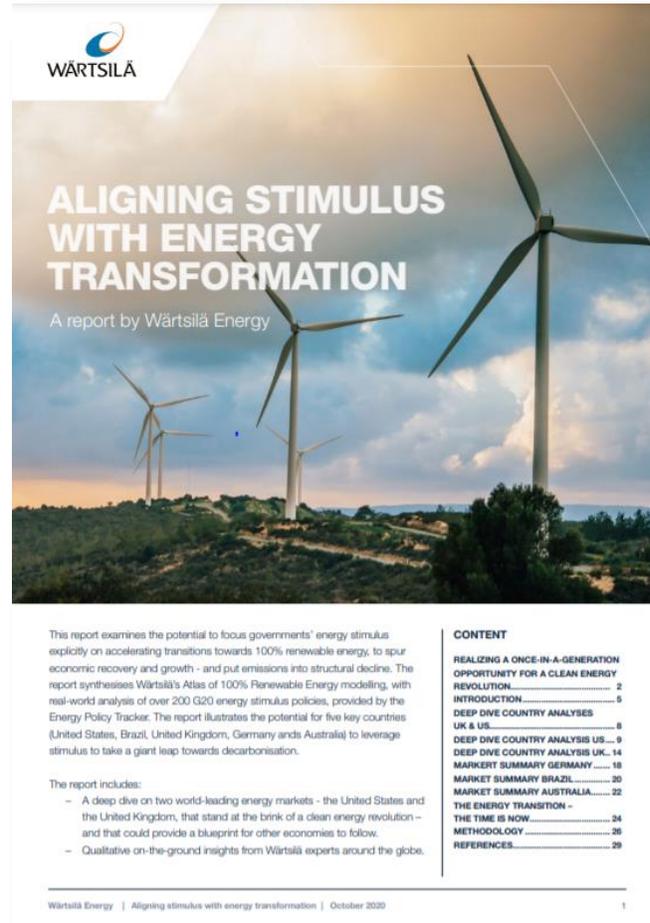
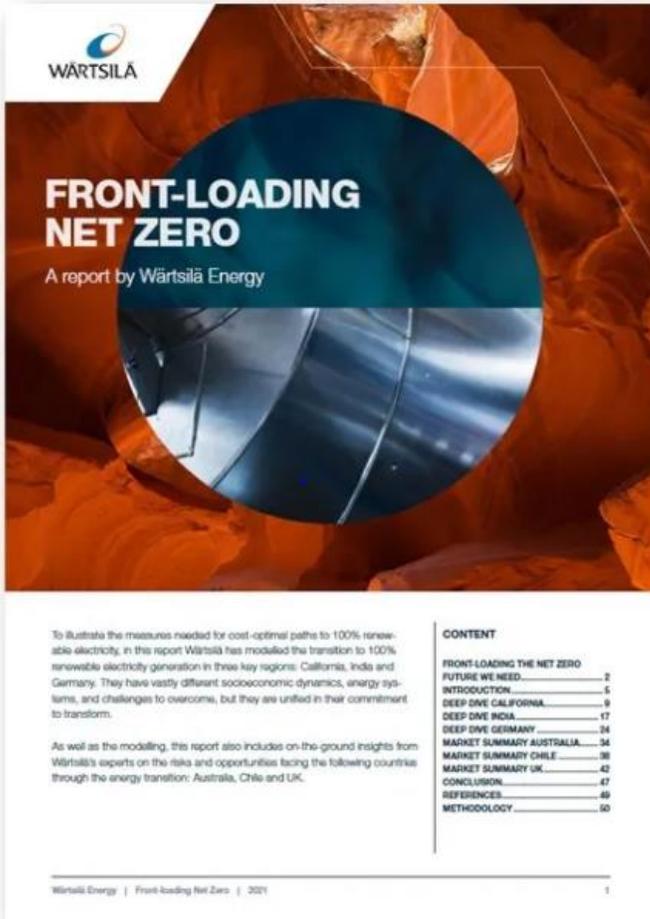
Inflexible system



Curtailement



Careful planning of future energy systems will save billions of euros and rapidly reduce CO₂ emissions – Wärtsilä is the go-to partner in power system modelling

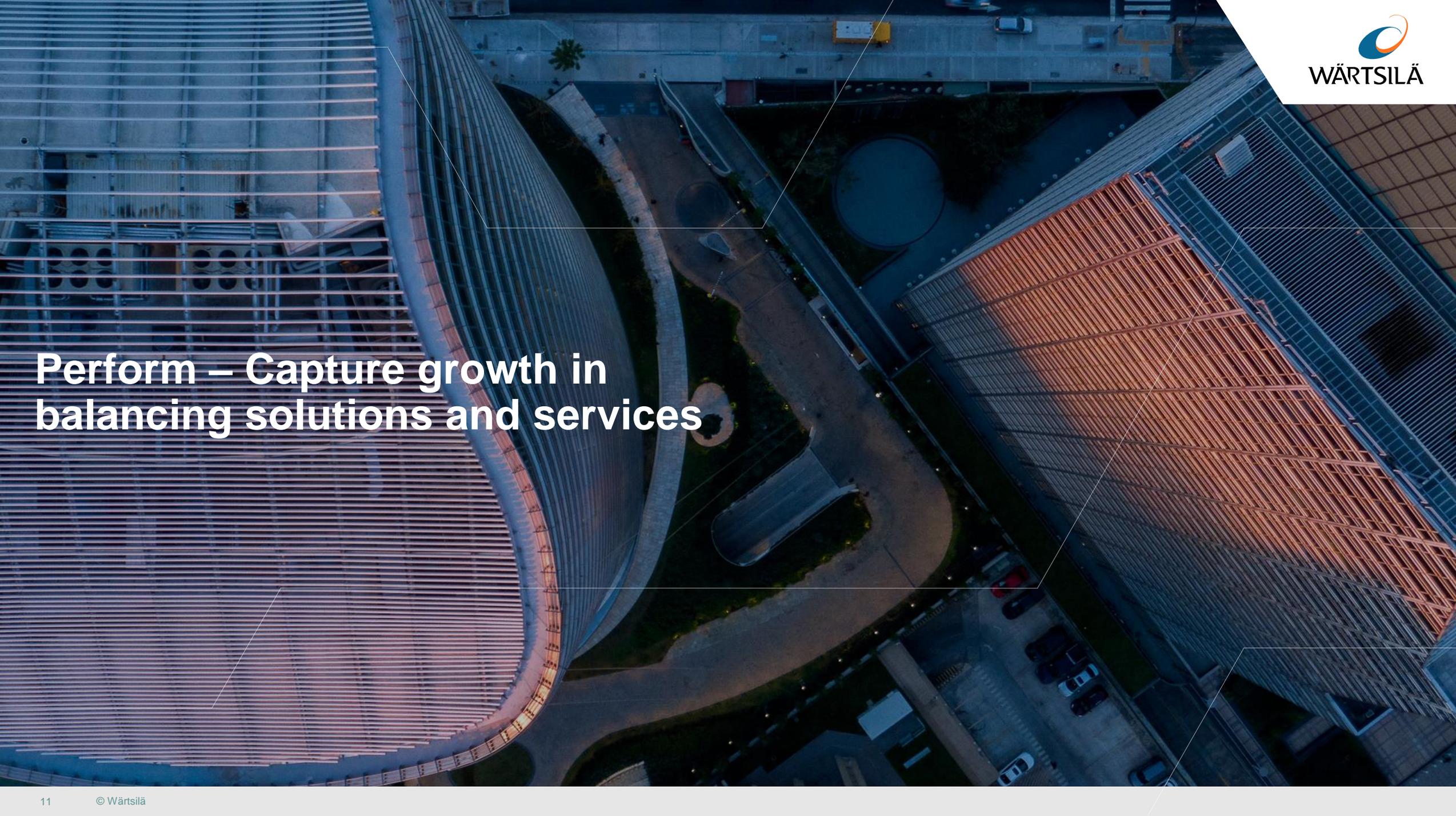


Power system modelling

- Wärtsilä has carried out over 150 country and system studies worldwide
- A rapid worldwide shift towards net zero energy systems is feasible and affordable with technologies that already exist
- Significant potential in Germany & India

Download
Front-loading net zero report





**Perform – Capture growth in
balancing solutions and services**

Balancing market growing 10X – capturing the opportunity in thermal balancing, energy storage and services

- 1** Tap into thermal balancing & energy storage **growth opportunities** and maintain **top 3 market position**
- 2** Create value through our **strong power system knowledge** and **experience** by **integrating different generation assets**
- 3** **Increase agreement coverage** of the installed base through performance-based agreements
- 4** Tap into the **10 GW fuel conversion opportunity**

Power system optimisation for the lowest energy cost, highest uptime and reliability



Thermal balancing



Energy storage



Services

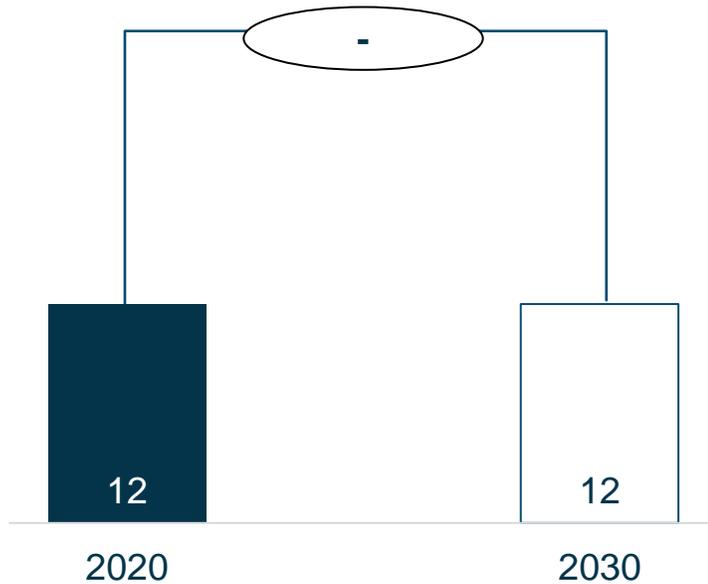


Software & digitalisation

Thermal balancing market will grow by 30% per year – driven by increase in renewables and coal-phase out

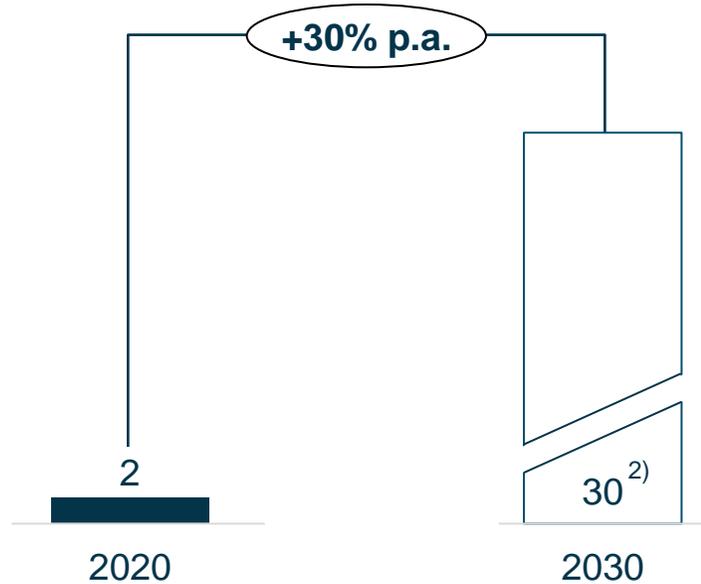
Baseload – (Global #1-5¹⁾)

Addressable annual market (GW)



Thermal balancing (Global #1-3¹⁾)

Addressable annual market (GW)



Outlook

- Increased **market activity**, thermal balancing included in capacity addition plans in Brazil, USA and South Africa
- 40 countries have pledged **coal-phase out**, 90 GW³⁾ to be phased out in this decade
- **Gas** critical in this decade, after 2030 use of hydrogen and other low-carbon fuels will increase

Source: Bloomberg New Energy Outlook 2020, Wärtsilä estimates 1) Market position 2) Key markets 10-15 GW
3) IEA Net zero scenario 2021

Our continued success in thermal balancing demonstrates the strength of our engine portfolio – installed base increasing to 8 GW



Recently awarded contracts for > 1 GW

- Brazil three contracts totalling 150 MW awarded for reserve auction
- Latin America two contracts totalling 600 MW and valued at 480MEUR awarded
- USA contract with Omaha Public Power District for 156 MW awarded
- Italy six projects with Meta Energia totalling 380 MW awarded
- **Thermal balancing installed base increasing to 8 GW**



The 211 MW Barker Inlet power plant in South Australia outperforms all other balancing and baseload plants with its flexibility features¹⁾

Reciprocating internal combustion engine is the best technology for thermal balancing

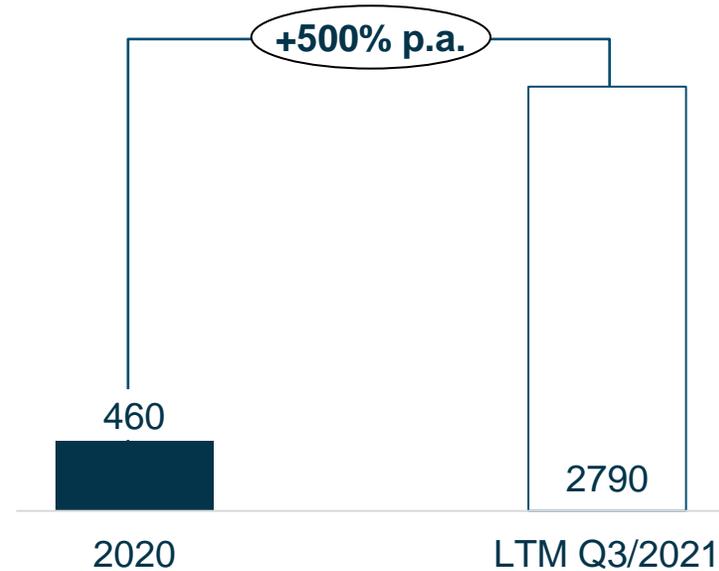
- 1** Continuous **ramp-up/down** for renewables
- 2** **Cycling** several times per day with **no cost impact**
- 3** **Modularity** – multiple units with **high efficiency**
- 4** **Catching price spikes** 30+% better than competition
- 5** **Avoiding negative prices** 40+% more start/stops
- 6** **Baseload** when needed

1) Source: AEMO NEM data - Wärtsilä study

Our energy storage business is growing rapidly, by leveraging our power system competence and integration capabilities

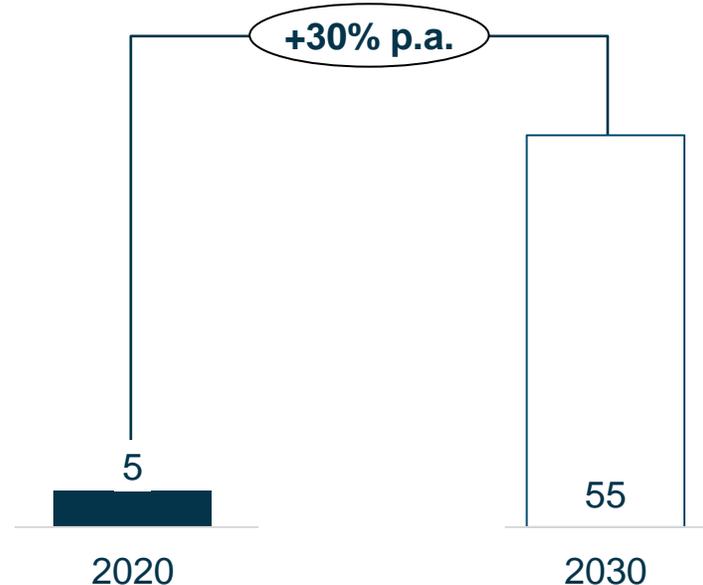
Order intake

Order intake (MWh)



Energy storage (Global #1-3)

Addressable annual market (GWh) ¹⁾



Outlook

- Maintain **top 3** market position
- 2021 order intake for energy storage expected to be > **EUR 700m**
- **4 GWh** delivered or awarded, with many of the largest energy majors
- **Complexity drives demand** for advanced energy management systems
- Business expected to be **profitable** within a few years

Source: Bloomberg New Energy Outlook 2020, Wärtsilä estimates 1) Addressable market excluding certain geographical markets and residential and commercial storage

Deep know-how in power systems and integrating generation assets, plus strong project execution capabilities creates differentiation

Energy storage roadmap

Power system optimisation

- Combine our **deep understanding** of different technologies and software, integrating generation assets, and **maximising** the lifetime **revenue** potential for customers
- Continuously **invest** to maintain our **leading position** in power system optimisation, and explore different **revenue models** with **performance-based incentives**

Execution

- **Partnerships** with world leading **battery cell** providers
- Combine **strong customer base** with **Wärtsilä's global network**
- Systematically scale the Energy storage organisation and leverage **strong project management capabilities**



Wärtsilä's power system optimisation and asset integration creates value across multiple customer segments

AGL 250 MWh - Australia



*"We are pleased to work with Wärtsilä on this project, who bring **critical expertise** and **technology** to bring this project to life."*
Markus Brokhof, AGL COO

RWE Renewables 80 MWh - USA



IntelliBidder auto-bidding solution **maximises value** to Georgia Power by value stacking **solar firming** through **forecasting** and **asset optimisation**

Able Grid 200 MW - USA



*"Able Grid selected Wärtsilä technology, among other considerations, for its **critical safety** and **cyber-security** features."*
Sharon Greenberg, Able Grid COO

B2Gold 15 MWh - Mali

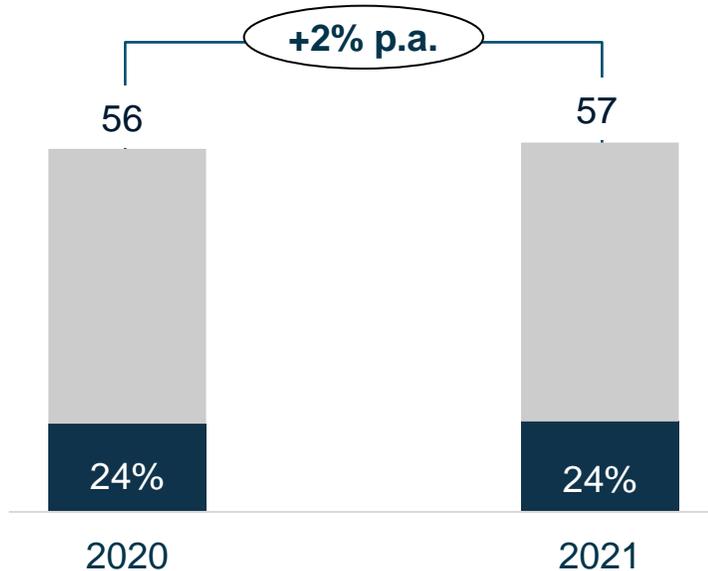


The thermal, solar & battery hybrid plant **reduced** gold processing **cost by 7%**.
*"GEMS is basically the **quarterback of the team**"*
Dennis Stansbury, B2Gold Senior VP

Moving up the service value ladder with performance-based agreements – fuel conversions provide a notable growth opportunity

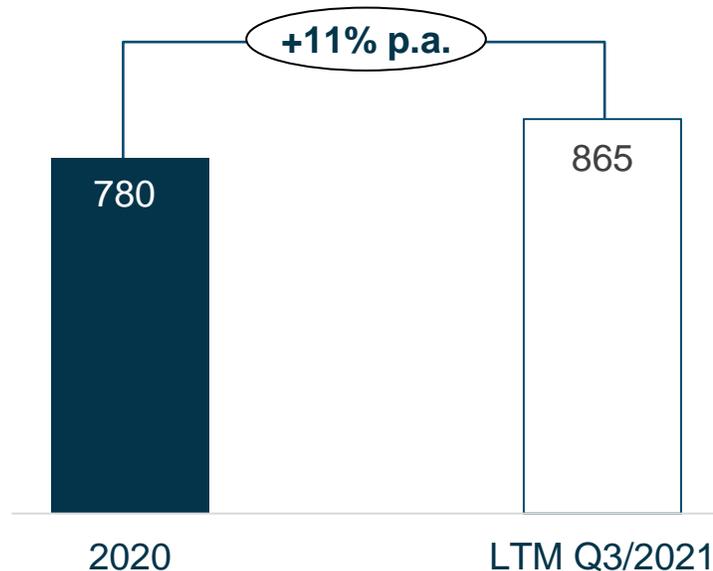
Operating installed base

Installed base (GW) & agreement coverage (%)



Net sales

MEUR



Outlook

- Complexity of power systems drive need for **optimisation services** and **performance-based agreements**
- **Fuel conversion** opportunity of 10 GW
- Strategic focus on increasing **agreement coverage** and **EUR/kW** of installed base
- Expanding **digital offering** in remote and autonomous operations – 92% of support cases already solved remotely

Capture growth through increased agreement coverage, performance-based agreements and conversion projects

Increasing agreement coverage

- **Power system optimisation software** optimises all generation assets while ensuring **reliability** of the plant & grid
- Optimisation services **reduce customers' CO₂ emissions** and **generation cost**. Potential to offset revenues from less running hours
- Performance-based partnerships with **shared benefits**
- Expertise Centres provide remote support with **predictive maintenance & anomaly detection**

Fuel conversions

- Fuel conversions from liquid fuels to gas represents a **10 GW¹⁾** conversion opportunity during the this decade
- Wärtsilä has already converted or been awarded projects totalling **1.5 GW**
- **Sustainable fuel conversions** will provide opportunities on a longer term basis

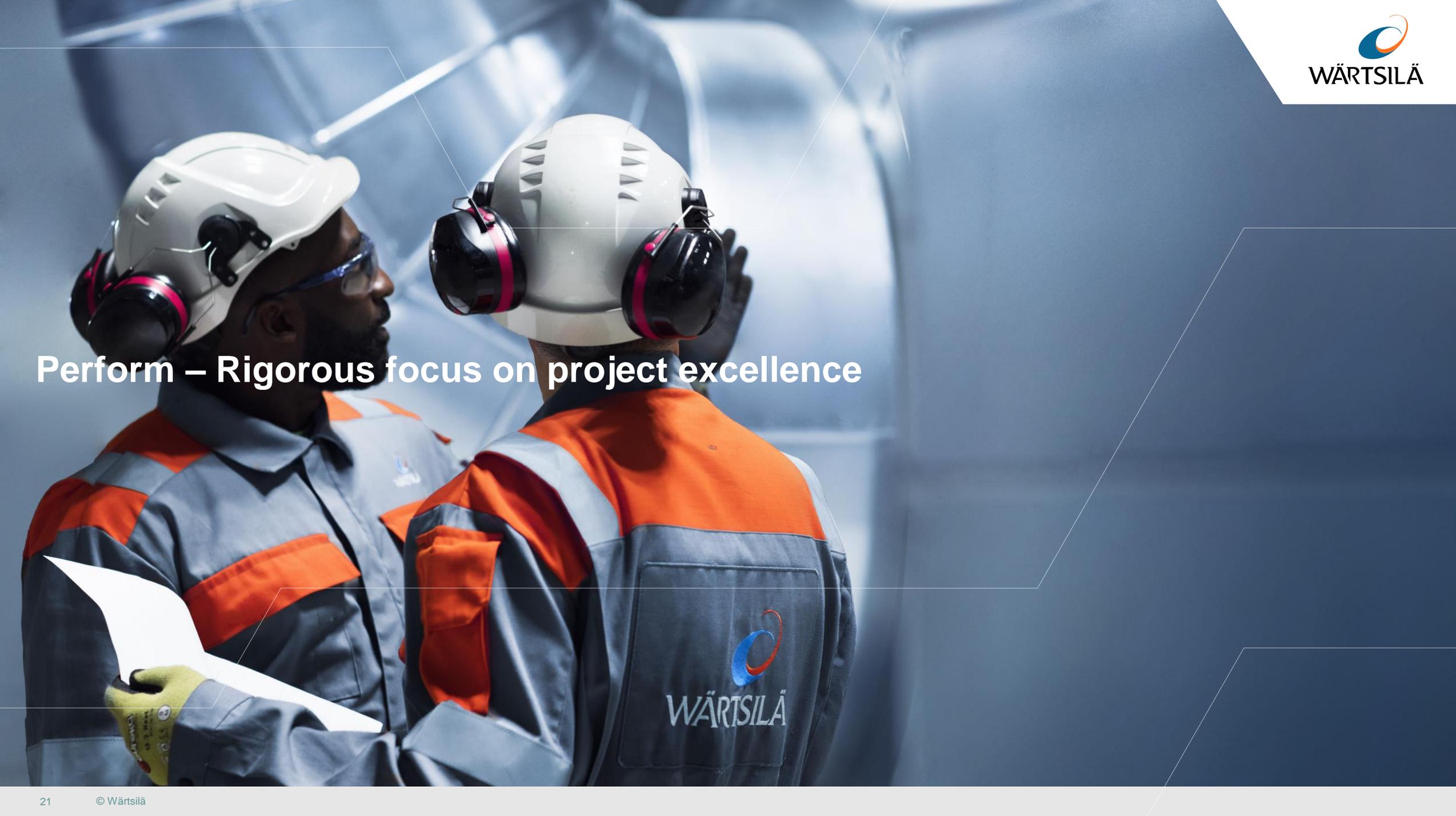
1) Subject to fuel availability



Customer reference

Newcrest

Wärtsilä and Lihir Gold sign 10-year service agreement for a 170 MW power plant with shared business case incentives



Perform – Rigorous focus on project excellence



Rigorous actions taken to deliver project excellence and robust performance

- **Risk and requirement** management for capturing and executing projects
- **Project management** and **resource planning** for robust execution
- **Sales and operations** planning to improve productivity
- **Leadership** and **performance management** with continuous improvement mindset

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Set for performance through services growth and project excellence



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