

Capital Markets Day

Growing Solar and Wind

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Fortum solar power plant, India

Agenda

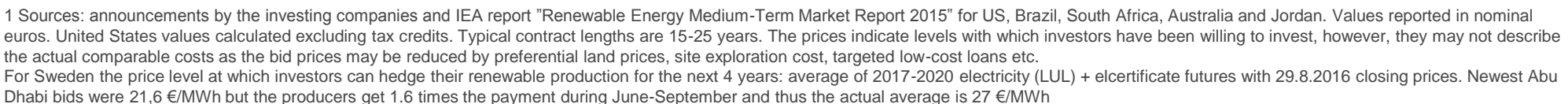
- Current market and drivers
 - Technology drivers
 - System integration
 - Changing business models and value creation
- Solar
- Wind
- Summary



A wide-angle photograph of a large solar power plant at sunset. The sun is low on the horizon, casting a warm orange glow over the scene. Rows of solar panels are visible, reflecting the sunlight. In the top left corner, there are four small colored squares: green, blue, red, and yellow.

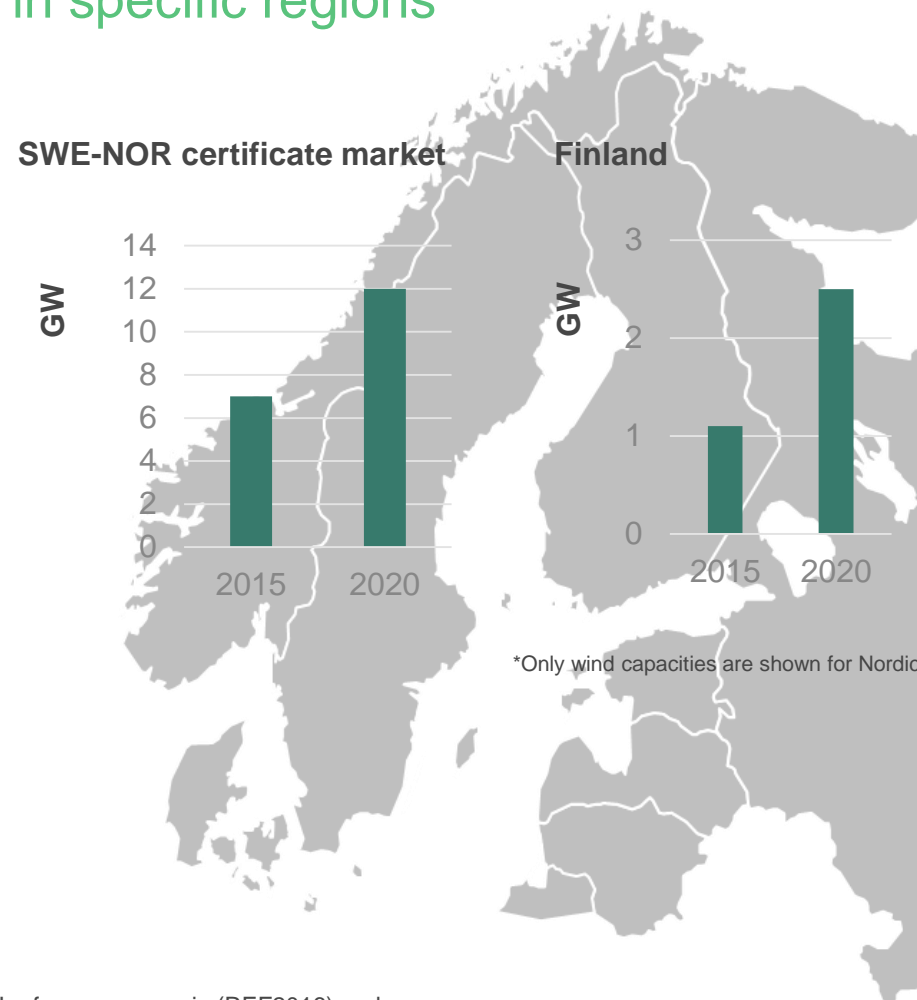
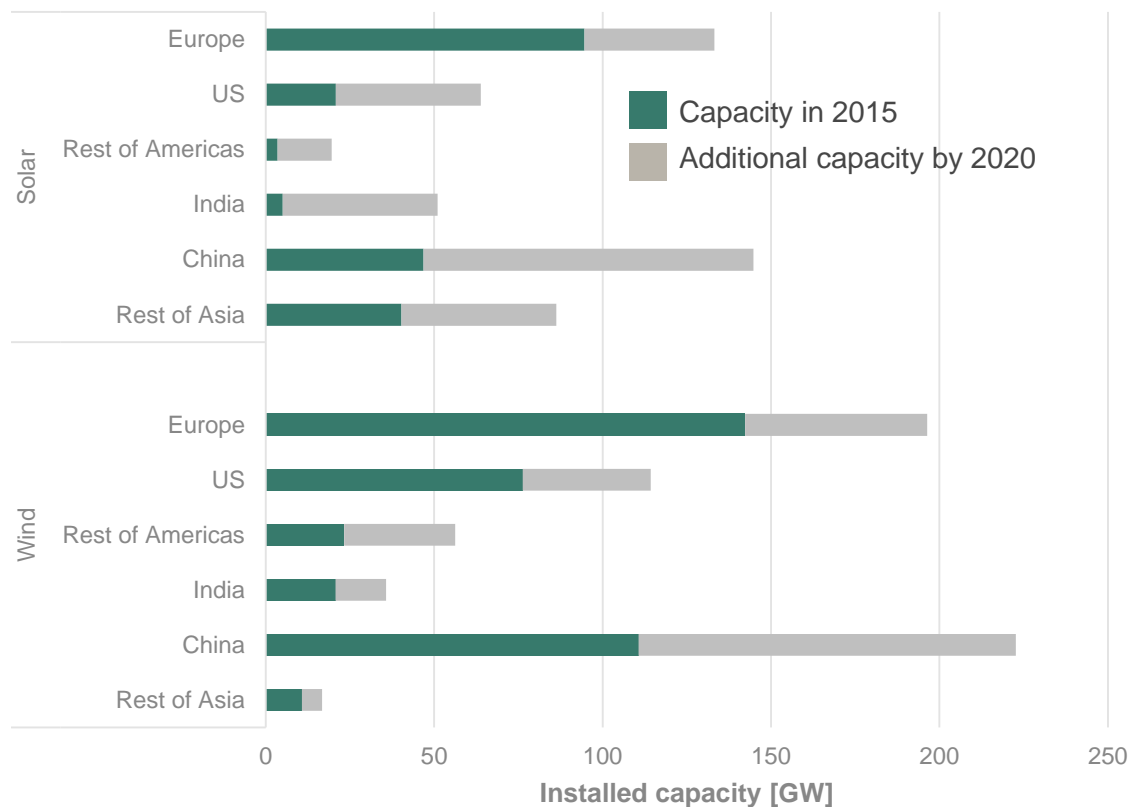
**In less than 2 hours the Earth
receives the amount of energy
we consume annually**

Lowest recently announced long-term PPA contract prices and auction results, without subsidies¹



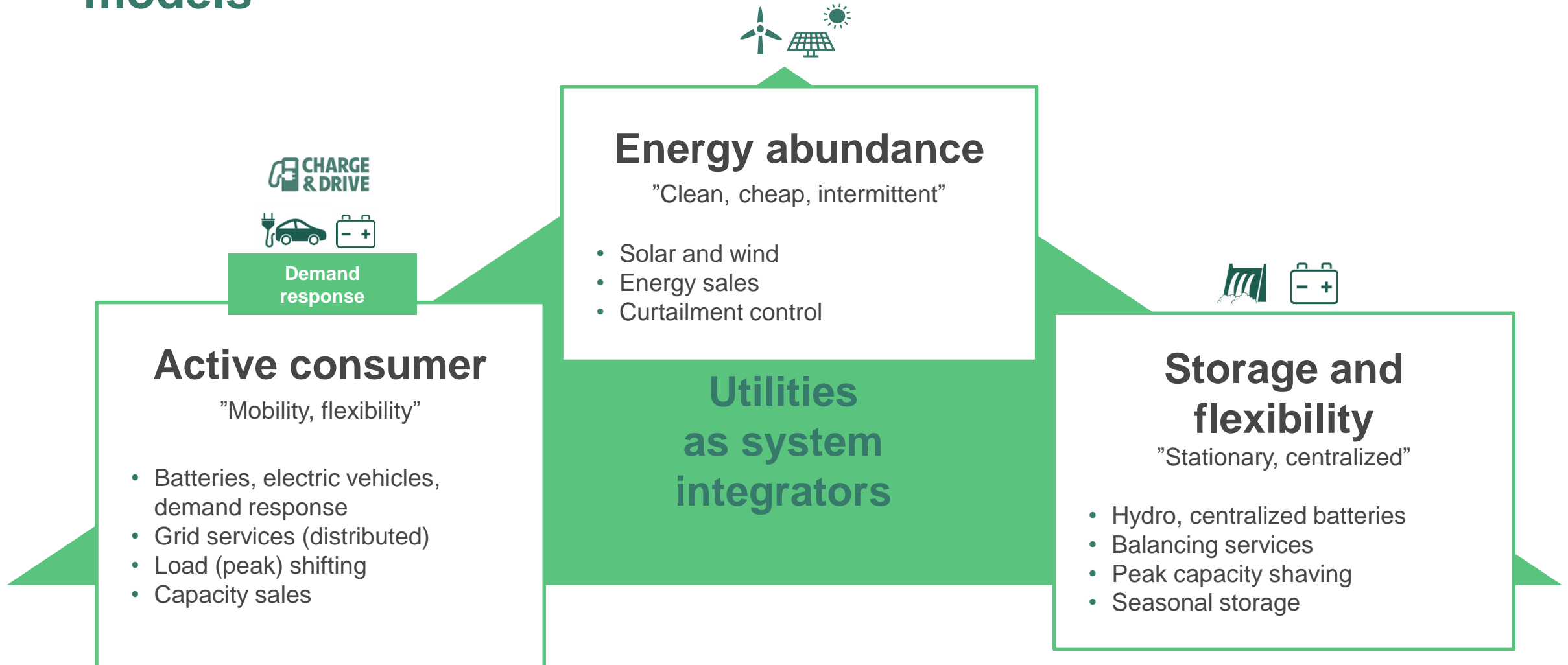
Growth in wind and solar accelerating globally and in Fortum's home markets

Solar and wind capacity increase from 2015 to 2020 in specific regions



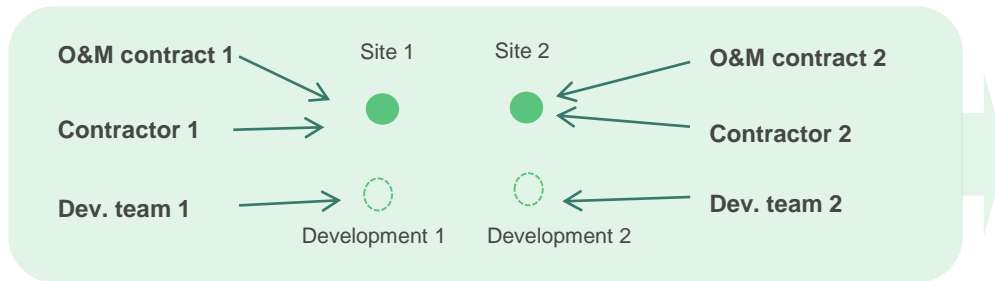
Sources: 2015 installed capacities from U.S. Energy Information Administration, Capacity additions for Europe from EU reference scenario (REF2016) and rest of the world from Bloomberg New Energy Finance NEO2016. 27% capacity factor was used to convert EU Ref2016 energies into capacity figures 2.5 GW 2020 target is used for Finland

System integration has significant value creation opportunity in the future – solar and wind essential part of new business models

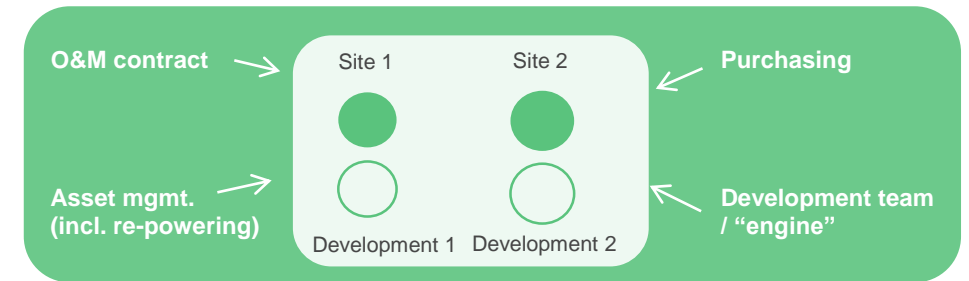


From scattered operations to large-scale synergistic value creation

CURRENT SITUATION



FUTURE VISION



PAST TRENDS:

PROJECT DEVELOPMENT

PURCHASING

CONSTRUCTION

O&M AND ASSET MGMT

TRADING & SYSTEM INTEGRATION

CAPITAL RECYCLING/ CO-INVESTORS

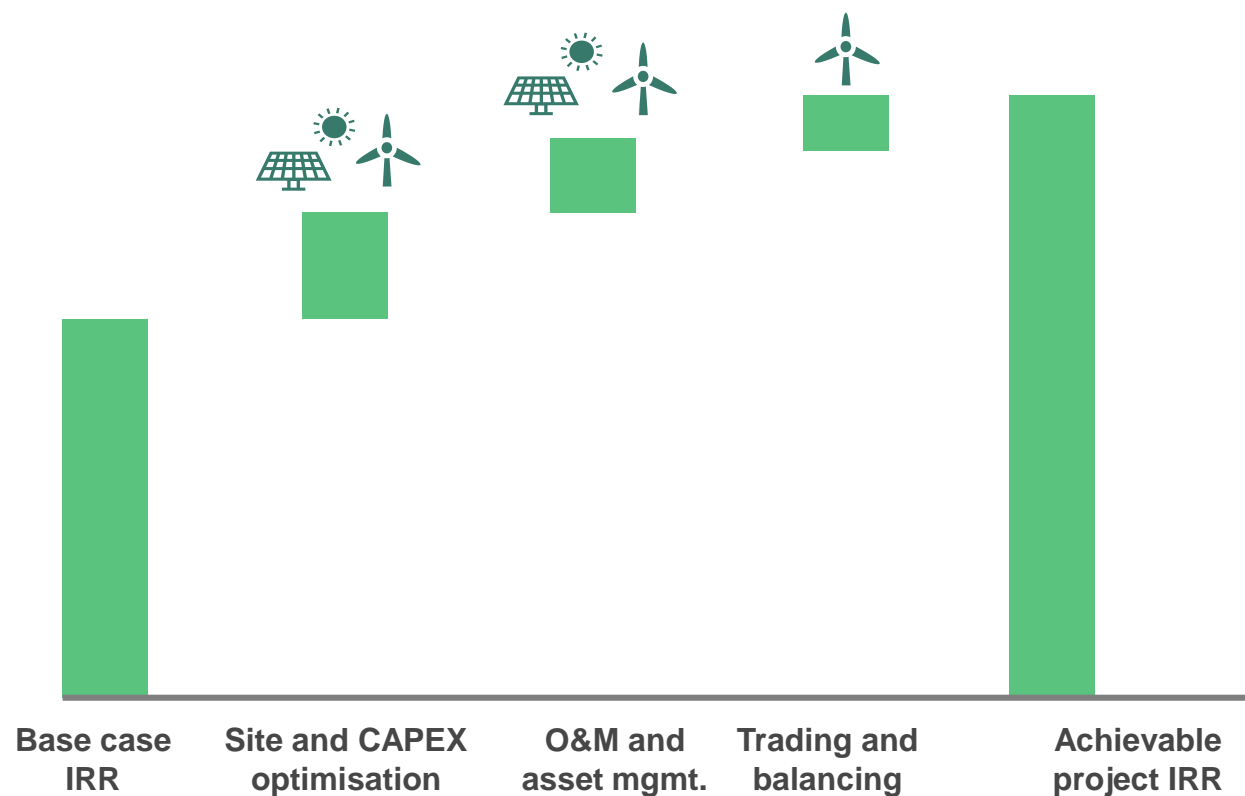
- Large number of developers selling individual projects to investors
- Scattered ownership of parks
- Suppliers have high bargaining power
- Project construction mainly by engineering, procurement and construction (EPC) companies on turn-key basis
- Asset portfolios scattered
- O&M by done suppliers / EPC contractor
- Trading only in limited number of markets
- Co-investment models typically only in large scale offshore projects

FORTUM'S "INDUSTRIAL" MODEL:

- Portfolio approach and efficient own development
- Partnerships with local early stage developers
- Economies of scale and high purchase power for industrial player
- Engineering, procurement and construction management model with Fortum as a industrial owner taking part of construction risk to boost returns
- Asset portfolios clustered and larger parks
- O&M and asset management optimisation
- Electricity trading and balance management
- New electricity sales / PPA products to customers
- Assets packaged to portfolios and de-risked part can be sold to financial investors

Fortum competences to extract maximum value from wind and solar assets

Confirmed IRR improvements through utilisation of Fortum competences



Additional IRR-levers

In market-based schemes:
System integration, smart
offering to end consumers,
potential price recovery



In tariff / power purchase
agreement (PPA) scheme:
Sell shares of de-risked assets to
financial investors with lower return
target

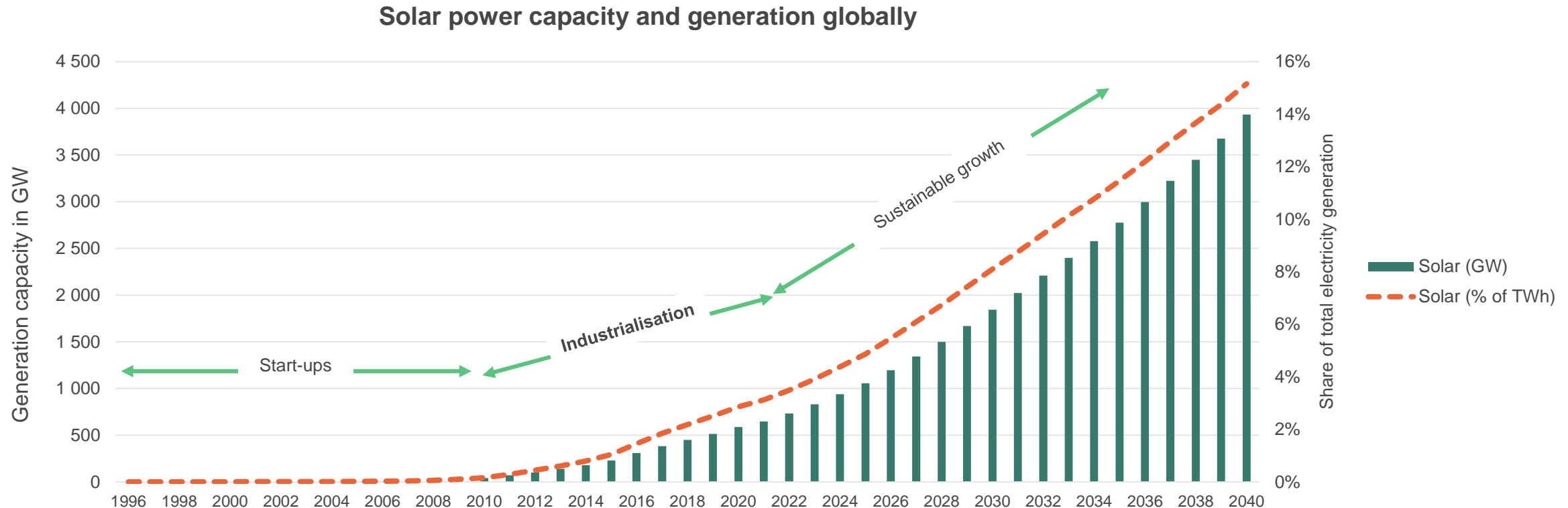




Solar power

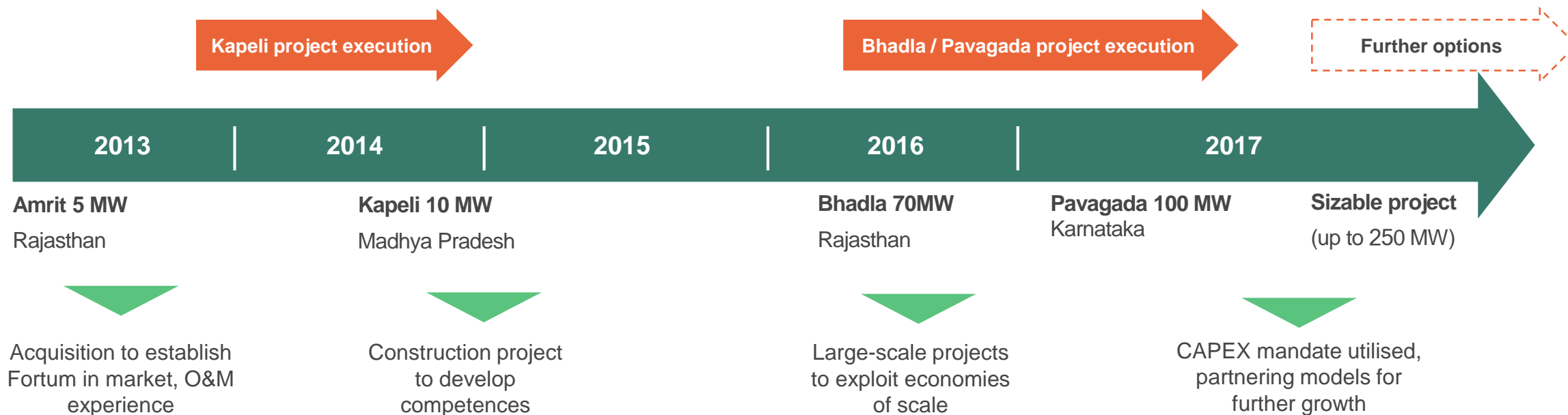
Solar to grow even faster in next decades profoundly impacting power markets – utilities are needed for system integration

Already today, solar power is fundamentally changing energy systems



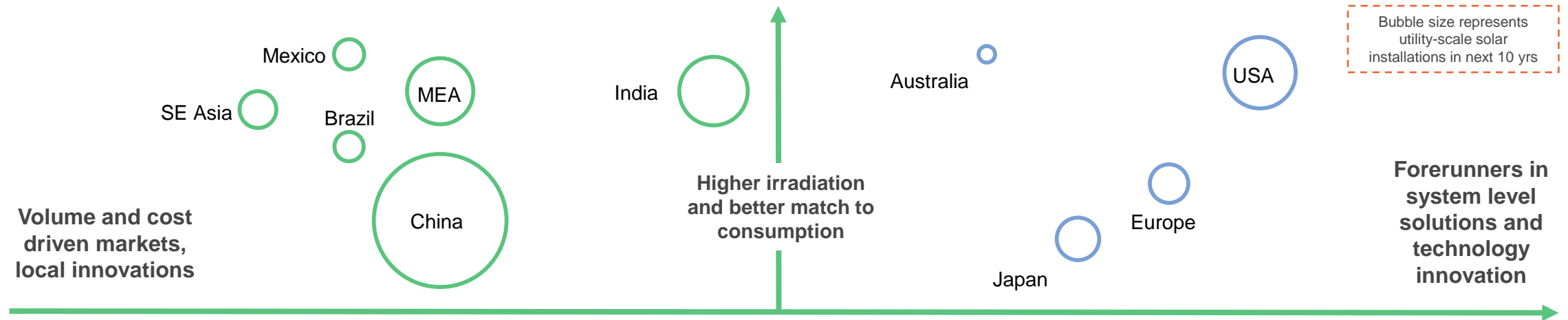
Sources: BP Statistical Review (for years 1996-2015), BNEF New Energy Outlook 2016 (for years 2016-2040)

Solar competences and scale that can be financially leveraged in India



- Fortum has gradually increased investments with attractive return levels
- With the targeted investments the 200–400 MEUR mandate almost filled
- Target to create sizeable portfolio – consider alternative structures and business models

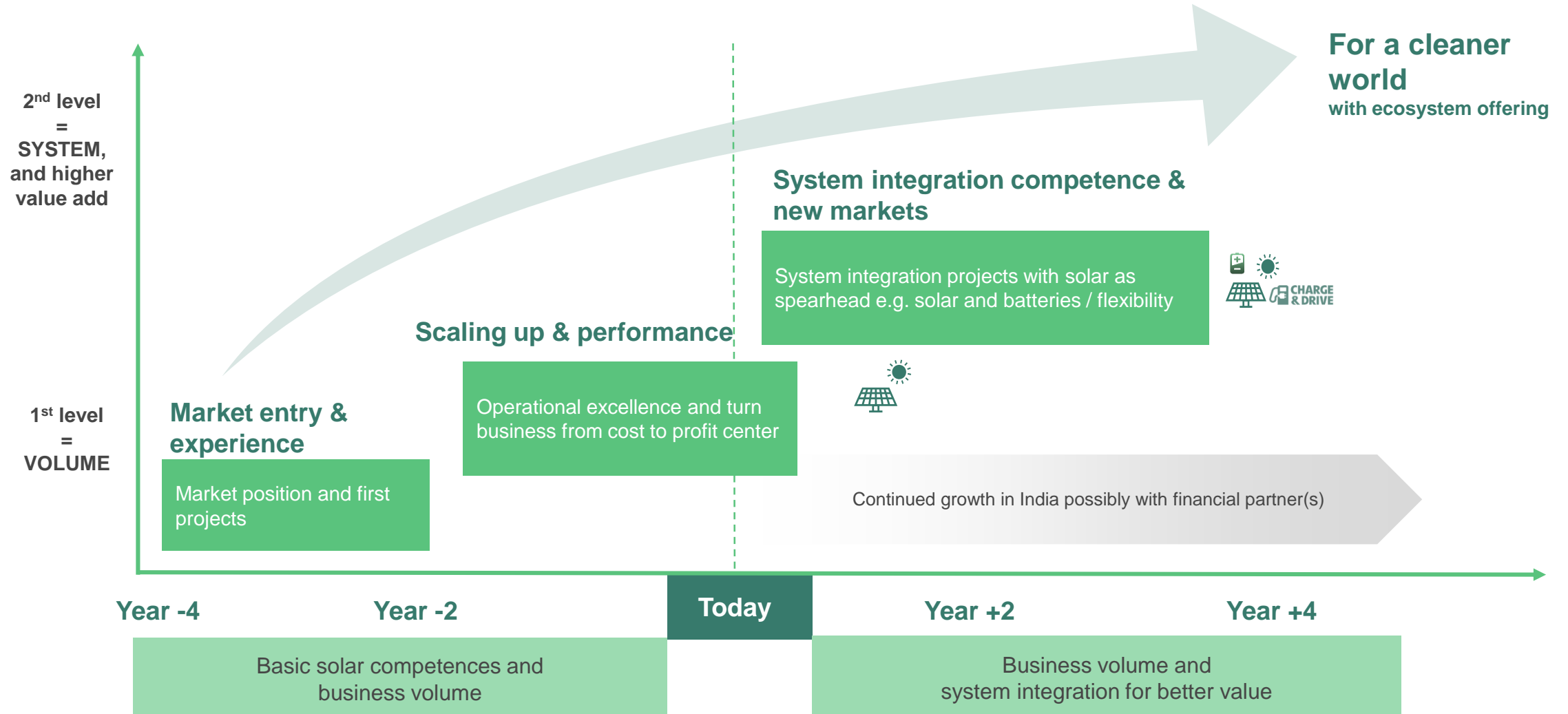
Attractive next step after India is to add value in system integration



FORTUM TARGET	Critical mass with capital recycling	Reasonable volumes with value creation from system integration
Market type	Developing economies for volume	Mature economies for system integration
Solar demand driver	Need of new generation capacity	Need of decarbonisation and aging capacity replacements
Type of demand	Government-driven auctions and tariffs	+ open market-based volumes
Value creation	CAPEX/OPEX optimisation, site selection	+ system enhancing solutions, optimisation, integration
Innovation	Local solutions, e.g. microgrids	Global solutions in business models, storage and digitalisation
Country and FX risk	Above average	Below average

MEA = Middle East and Africa, SE Asia = Southeast Asia
Source: Bloomberg New Energy Finance, Fortum analysis

Energy system integration competence and business to be built further



A decorative graphic in the top-left corner consisting of four overlapping squares: a large green one, a smaller blue one, a small orange one, and a small yellow one.

Wind power

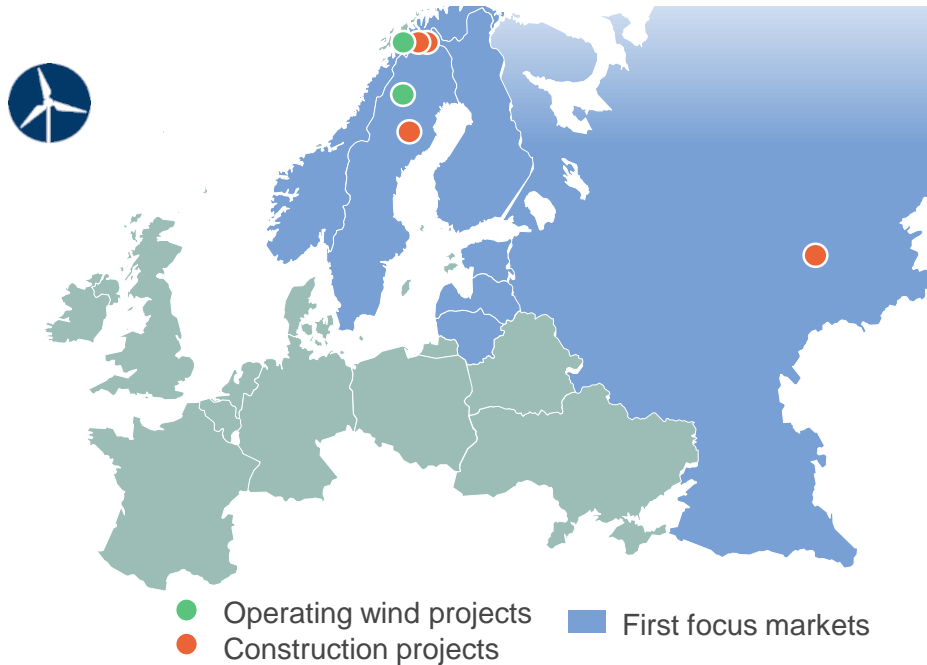


Utility competences becoming a critical part of value extraction from wind assets – excellent time for Fortum to enter

1. Wind power is moving out from fully regulated business – requiring utility competences
 - ▶ *Fortum market insight and competences in CAPEX optimization, asset management, trading and balancing drive premium in IRR-levels*
2. Onshore wind has most competitive new entry cost and will be major determinant of future power system and price levels
 - ▶ *Wind is becoming the technology of choice for replacing ageing conventional power plant fleet and development of storage (batteries) will accelerate the roll-out*
3. Ownership of wind assets still scattered in most markets
 - ▶ *Opportunity to become leading player in wind power by consolidating the market – particularly in the Nordics*
4. Wind power has been growing rapidly – strong growth will continue as the technology is maturing
 - ▶ *Sustainable growth market with economies of scale and synergies with the existing fleet*

Fortum to focus on onshore wind in Nord Pool area and Russia

Focus on Nord Pool area and Russia



Fortum's targets in Wind:

- Nord Pool area: up to 1,000 MW
- Russia: up to 500 MW utilizing CSA's

Highest value creation and competitive edge in home markets – Nord Pool area and Russia

- Selection of attractive projects & sites with high wind speed and low CAPEX – best sites to have further value through re-powering
- Sizeable wind clusters (100+ MW) for efficient asset management, local operation and maintenance
- Existing platform and competences for efficient project implementation and scalable operations
- Full utilisation of Fortum competences in trading and portfolio effect with hydropower (balancing)

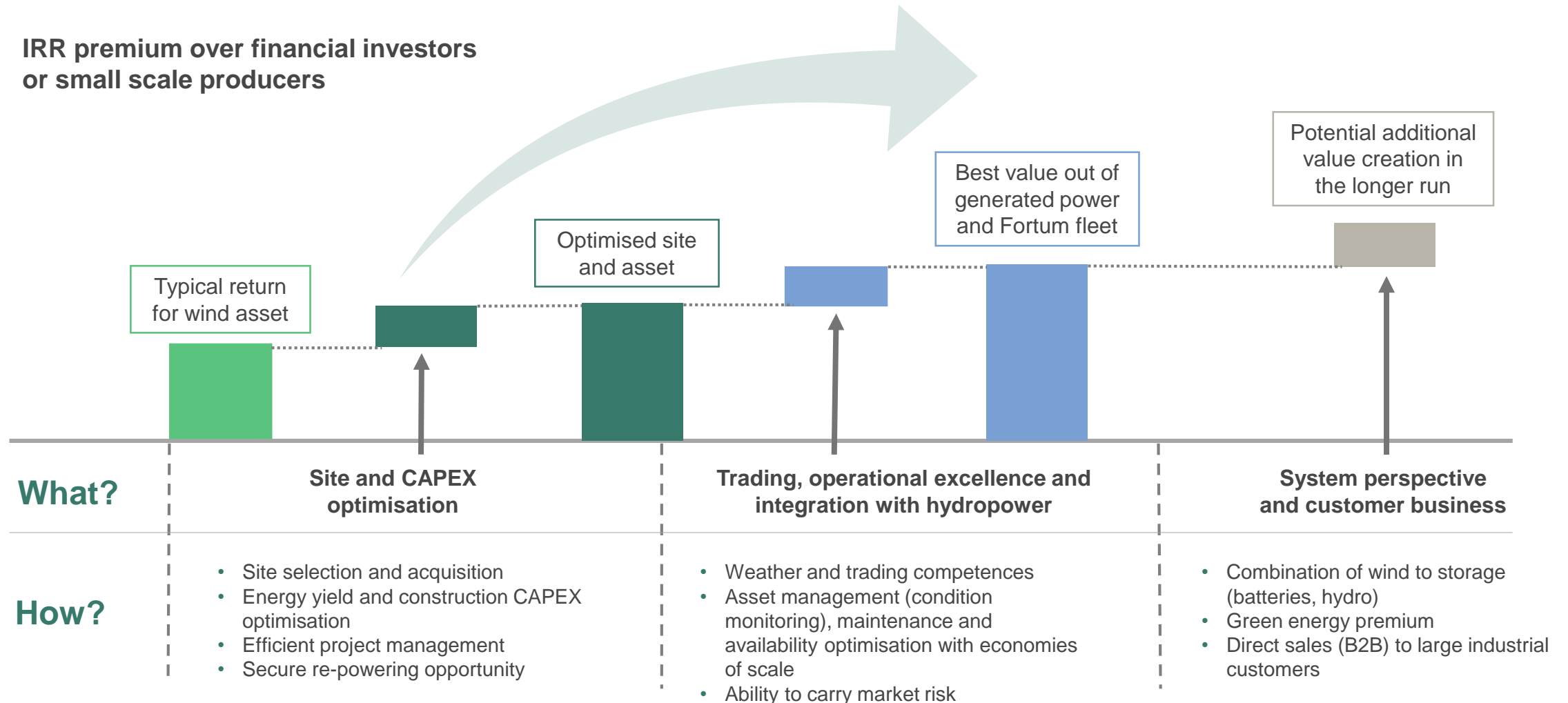


Build up ~1,000-1,500 MW wind portfolio

- Start with onshore wind in Nord Pool area in construction projects and existing assets
- Prospective entry in Baltics
- Russia - target up to 500 MW utilizing Capacity Supply Agreements (CSA)
- Assess entry options to other Fortum markets and wider European market in next wave
- In addition, a solid pipeline of projects

Fortum's fleet and competences maximize value from wind

IRR premium over financial investors
or small scale producers





Summary

- Wind and solar are fundamentally changing power systems globally
- Most competitive new entry costs of new power production
- Wind and solar pushed by cost competitiveness, customer demand and global climate change agenda
- Utility competences have become important part of value creation in renewables – more market based schemes to accelerate development

Fortum targets in wind and solar

- Target to reach GW-scale in wind and solar business
- Wind focus first in Nord Pool area and Russia
- Solar in India and in selected new market with system innovation needs
- Add value with utility competences along the value chain – clear premium above country and technology specific cost of capital
- Leverage solar and wind competence to be leading system integrator in 2020's

Q&A