

A photograph of two women standing in front of a modern building with large glass windows at dusk. The woman on the left has long blonde hair and is wearing a white top under a tan cardigan. The woman on the right has dark curly hair and is wearing a purple t-shirt. They are both looking towards the camera with slight smiles. The background shows the building's structure and a cityscape in the distance under a twilight sky.

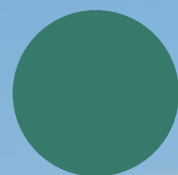
From SMRs R&D to Nuclear newbuild feasibility study

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SYP conference 2022

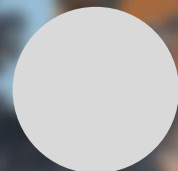
Fortum is a strong Nordic nuclear operator



Units fully owned by Fortum



Co-owned units

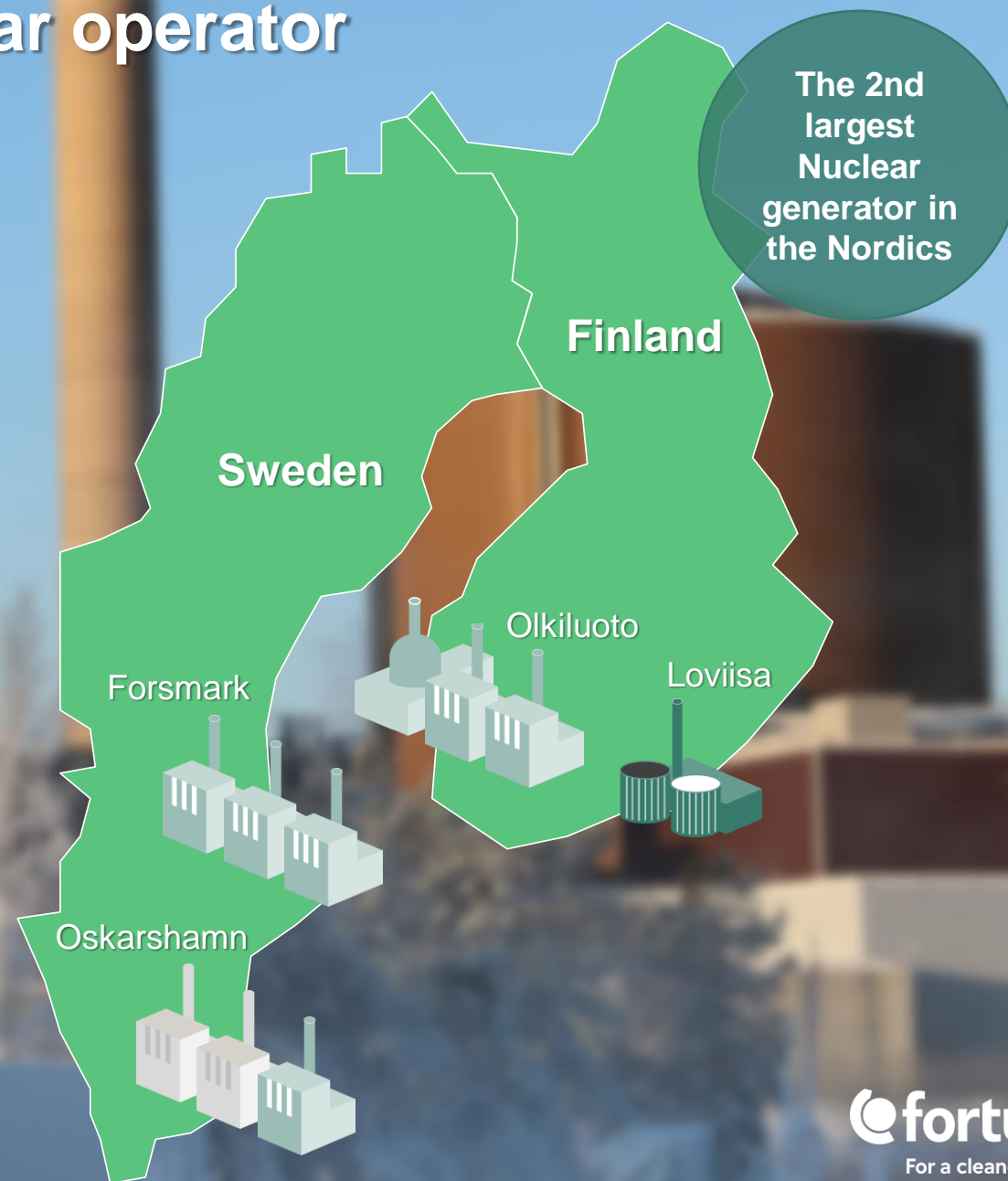


Units under decommissioning

Final Disposal:

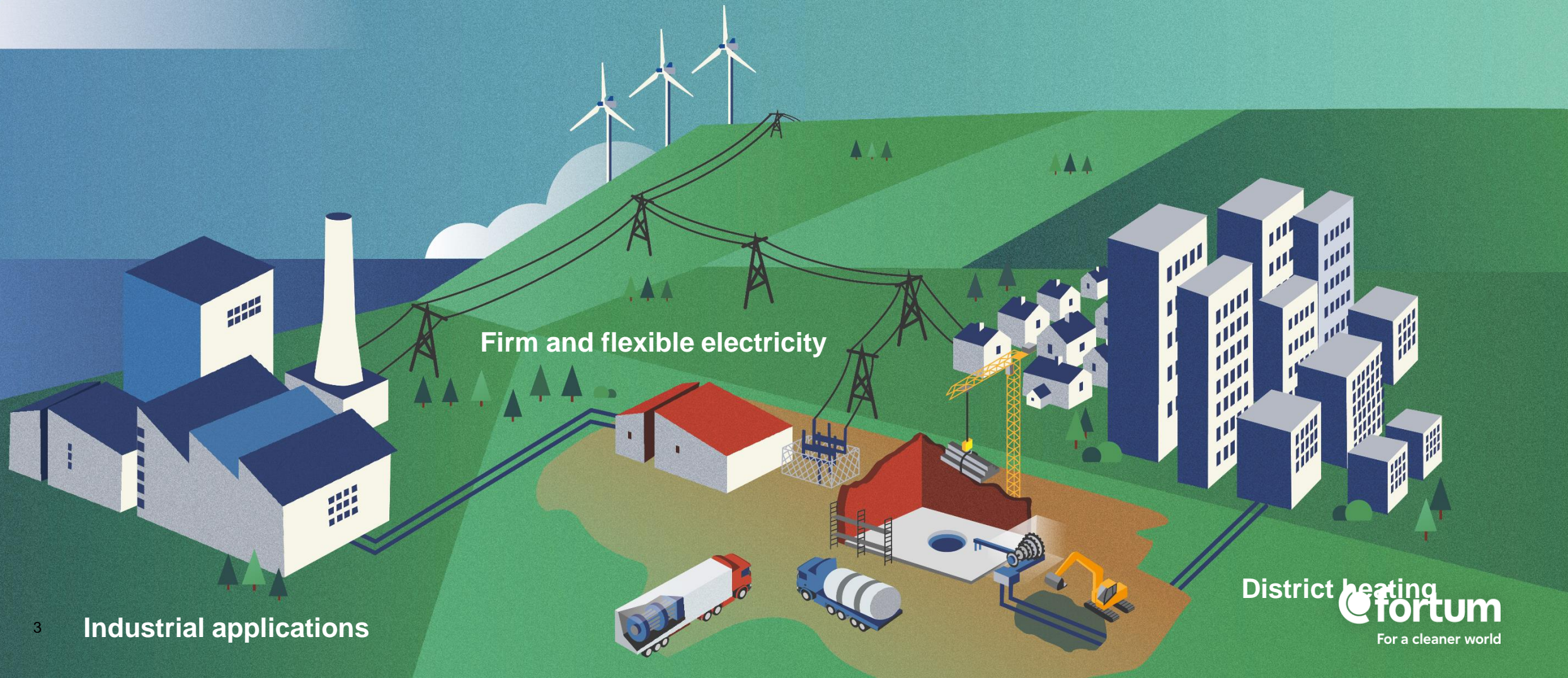
Fortum is a shareholder in spent fuel and waste management companies Posiva (FIN) and SKB (SWE)

Nuclear represents nearly half of energy generated by Fortum*



Small Modular Reactors (SMRs)

Decarbonizing societies



Fortum SMR activities – development activities and cooperation with customers

Research & development

- Licensing, safety design studies and tool & methodology development
- SMR district heating studies
- Vendor contacts
 - EdF & consortium – Nuward
 - GEH – BWRX-300
 - Rolls Royce – RR SMR
 - NuScale – VOYGR
 - ...

Co-operation and consultation activities

- ANITA – centre of excellence in Sweden (2022-)
- Nuward INAB (International Advisory Board) membership from 2021 onwards
- EURATOM projects: ELSMOR (2019-2023) and TANDEM (2022-)
- Business Finland EcoSMR project (2020-2022)
- MIT co-operation project – tool for nuclear project evaluation (2020-2023)
- EUR utility SMR position paper – technical working group (2019-2021)
- SMR consulting activities (Fermi Energia, Synthos)

Business development

- Business development related contacts from investor and other possible partners
- Uniper-Fortum co-operation next gen nuclear roadmap development
- Preliminary profitability calculations as part of nuclear strategy work
- Analyses of new business opportunities (e.g. heat production)
- Interest promotion – Nuclear legislation renewal
- SMR district heating strategy (2019)

Based on the work

We have a good overview on available technologies and what they offer

We have good understanding on regulatory bottlenecks and the aspects to be developed

We know what kind of expertise is needed to kickstart a project

Newbuild feasibility study

Commercial

Small and
Large NPPs

Societal,
political,
legal,
regulations

“Build future-proof, profitable and achievable business cases, to decarbonize, electrify and provide security of supply”



Our strategy is to focus on the Nordics and remain active on the European market as an experienced service provider



Important to develop the business model!

The typical “merchant electricity” business model may become challenging in the future

Due to the volatility of the electricity price and an abundance of low-cost intermittent RES in the future, the historical business model (i.e. merchant electricity w/o subsidies) may become risky and difficult to proceed with for nuclear operators

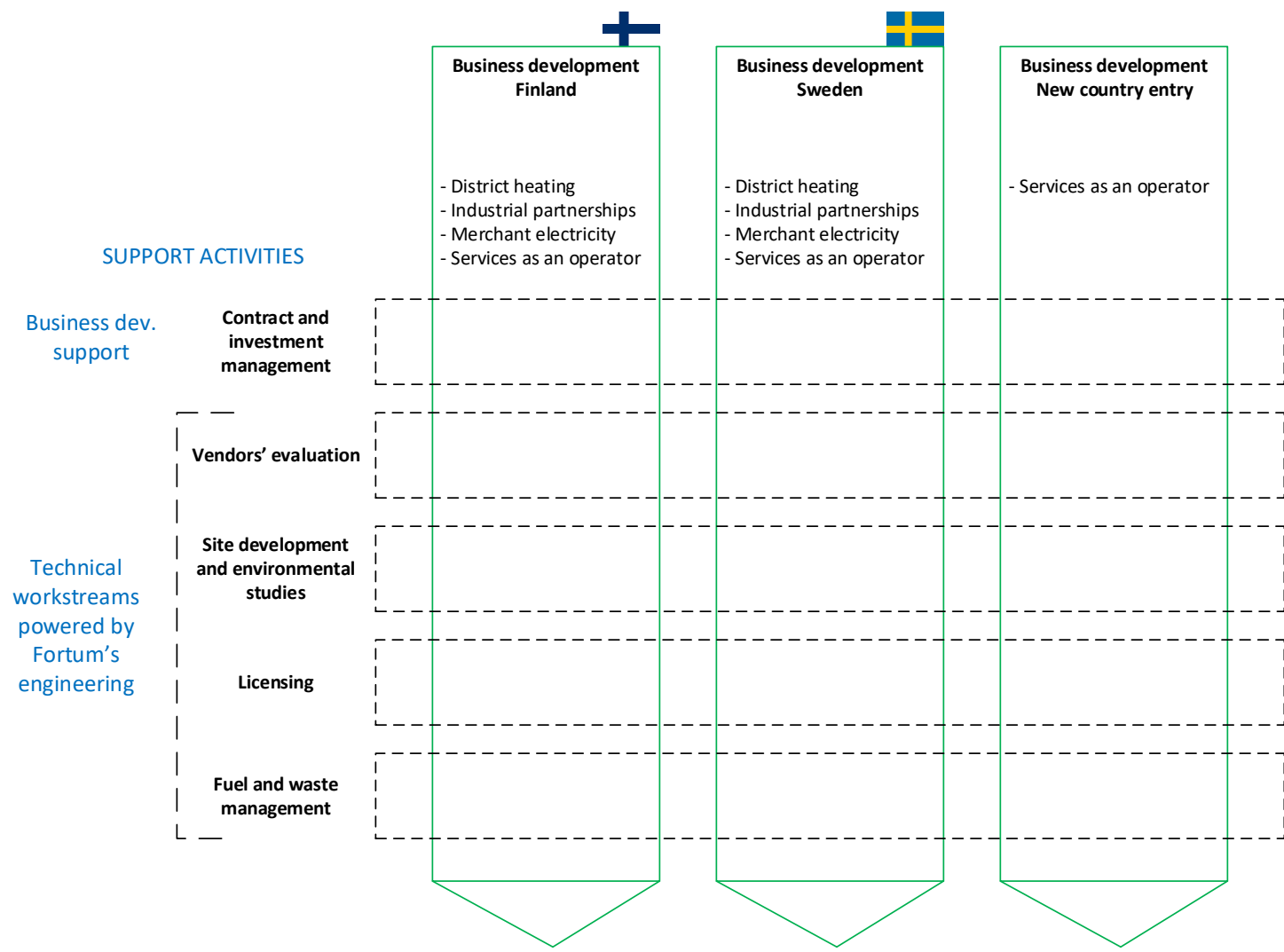
Improved business models and financial securing mechanisms must be used to:

- Increase and diversify the income streams
- Secure the income
- Optimize the CAPEX exposure
- Optimize the OPEX costs

In our view there are three concrete opportunities to secure nuclear economics:

 Co-generation <p>Other end-products than electricity can be generated to limit the exposure to the electricity market.</p> <p>The synergies with e.g. heat production, hydrogen, e-fuels represent promising diversification and growth opportunities.</p>	 Partnerships <p>Finding reliable partners enables sharing the risks and the costs of the projects, including possible co-investment models.</p> <p>Global partnerships can be created involving utilities, end-users (industrials), vendors and also regulators. Topics such as licensing and technology assessments are particularly appropriate.</p>	 Financial securing mechanisms <p>Long-term agreements such as PPAs (Power Purchase Agreement), CFDs (Contract For Difference) or RAB (Regulated Asset Base) can be used to limit the economical risks of nuclear projects.</p> <p>These mechanisms can be agreed either with end-users (industrials) willing to control their own costs or with a state as part of a national energy policy.</p>
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A business approach combined with a deep technical know-how



Fortum is looking for various partnerships to make the newbuild feasibility study a success and also provides a large range of nuclear services

Please contact us!



Thank you

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