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80 is the new 60!

Long Term Operation of Nuclear Power

Johan Lundberg, CEO of OKG Aktiebolag

Global Uniper at a glance

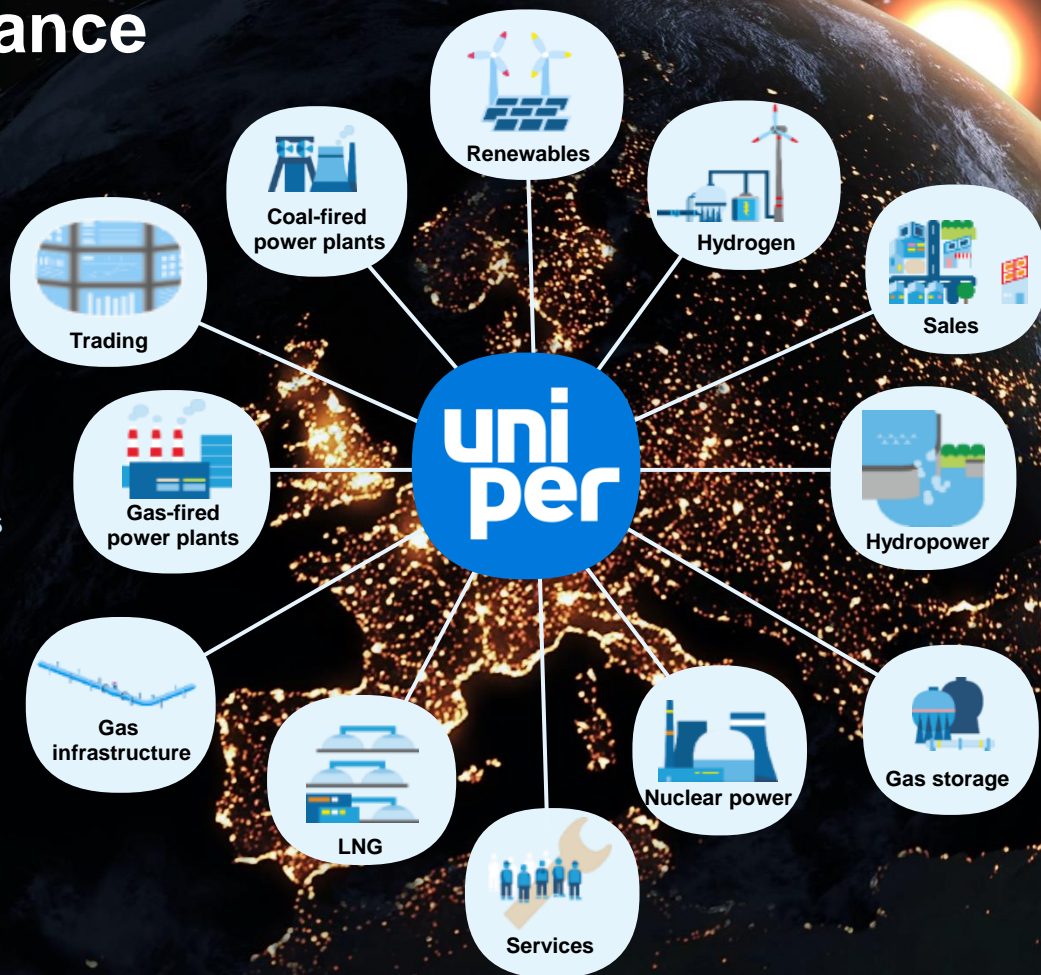
6,863 employees ensure security of supply in Europe

Active in more than **40** countries.

170,92 billion euros in sales (2023)

6,367 billion euros Adj. EBIT (2023)

~ **22.4** GW generation capacity



Uniper has a strong ownership in Swedish NPP's

Ringhals (RAB)

RAB 1 (2020)
RAB 2 (2019)
RAB 3
RAB 4

Barsebäck (BKAB)

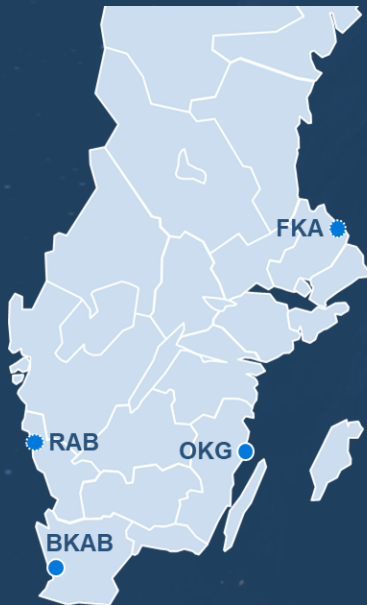
BKAB 1 (1999)
BKAB 2 (2005)

Forsmark (FKA)

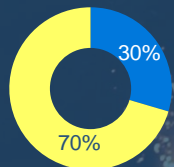
FKA 1
FKA 2
FKA 3

Oskarshamn (OKG)

OKG 1 (2017)
OKG 2 (2016)
OKG 3



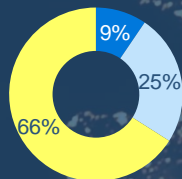
Ringhals (RAB)



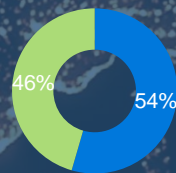
Barsebäck (BKAB)



Forsmark (FKA)



Oskarshamn (OKG)



Rationale for Lifetime Extension to 80 years



Nuclear power provides beneficial capabilities for a fossil-free electricity system with increased penetration of intermittent power production.



Lifetime extension is recognized as a cost- and resource efficient way to add fossil-free and plannable power production.



Positive experiences from lifetime extensions (40-60y) supports interest for further lifetime extensions (60-80y) with U.S. as a frontrunner.



Additional lifetime extension of existing nuclear is a cornerstone in the Swedish national strategy to meet forecasted demand driven by electrification of industry and transportation.

It's about the numbers...



With a decision to extend the operating time of the Swedish nuclear power fleet to 80 years, comes the potential to:



Maintain fossil-free plannable power for 20 years
(~ 7.000 MW)

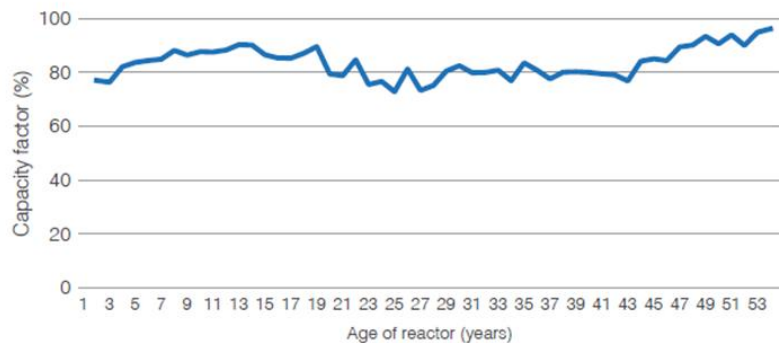


Expand fossil-free plannable power over 20 years
(~ 1.000 TWH)

Age is not an issue...

Age and availability - not correlated!

Figure 7. Mean capacity factor 2018-2022 by age of reactor



Source: World Nuclear Association, IAEA PRIS



A result of proactive modernization measures and maintenance programs.



Positive experience from national and international modernization programs.

Our ambition is that 80 will be the new 60 for O3



2020 Initial feasibility study of conditions for extending the operation of Oskarshamn 3 (O3) to 80 years.

2024 Decision-in-principle taken to proceed with necessary preparations and studies to take a final decision for extending the operation of O3:



- Aim for 80 years operation for O3
- Start preparation work for a final decision planned around 2030

**ELTO – Step 2
(Extended Long Term Operation)**

ELTO Step 2 – Planning and preparation for a final decision for O3



Technique



Define and refine scope, risks, technical issues, costs and time plan related to the plant scope developed in pre-study

Resources



Evaluate critical resources and competencies, both internally and externally for project phase of ELTO

Set-up ELTO



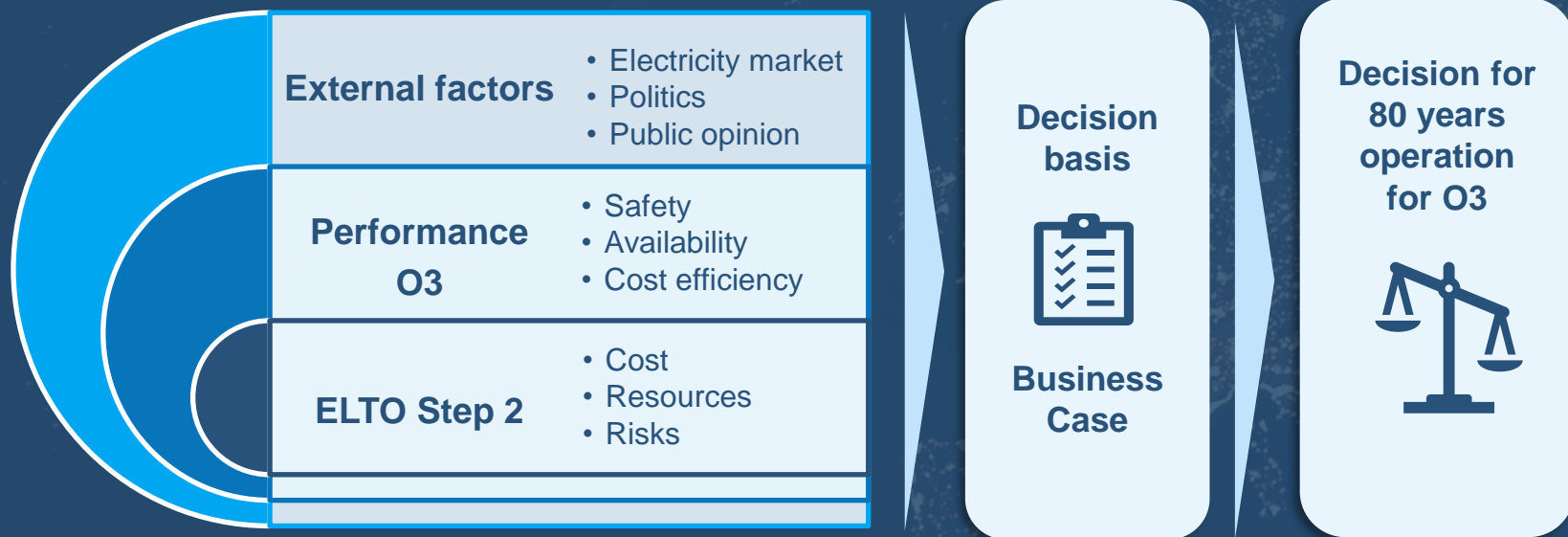
Define organizational set-up to coordinate and optimize the identified projects and activities required for ELTO

Co-operations



Develop a strategy for critical suppliers and technologies but also co-operations with other BWR-plants.

Critical factors for a final decision of Lifetime Extension to 80 years for O3



Lessons learned from previous modernizations



- ☯ Don't underestimate the challenge of a modernization program, especially if several programs are run in parallel in Sweden!
- ☯ Combined modernization and power-uprate is extra challenging as plant configuration is changed.
- ☯ Chose suppliers carefully – they will hopefully be your future partners.
- ☯ Modernization programs gives excellent learning opportunities for next generation of nuclear professionals in all parts of the industry.

Challenges for Lifetime Extension investments



- ⚛️ Lack of insight that Sweden needs lifetime extension of existing reactors to reach national electrification, and climate goals by 2045.
- ⚛️ A large investment project must be founded on a stable business case and associated risk evaluation including all aspects of the life cycle.
- ⚛️ Electrification efforts may create challenging market situations eroding the basis for investment in lifetime extension.
- ⚛️ Political and regulatory risks (market risks included) are challenging to handle in a lifetime extension decision.

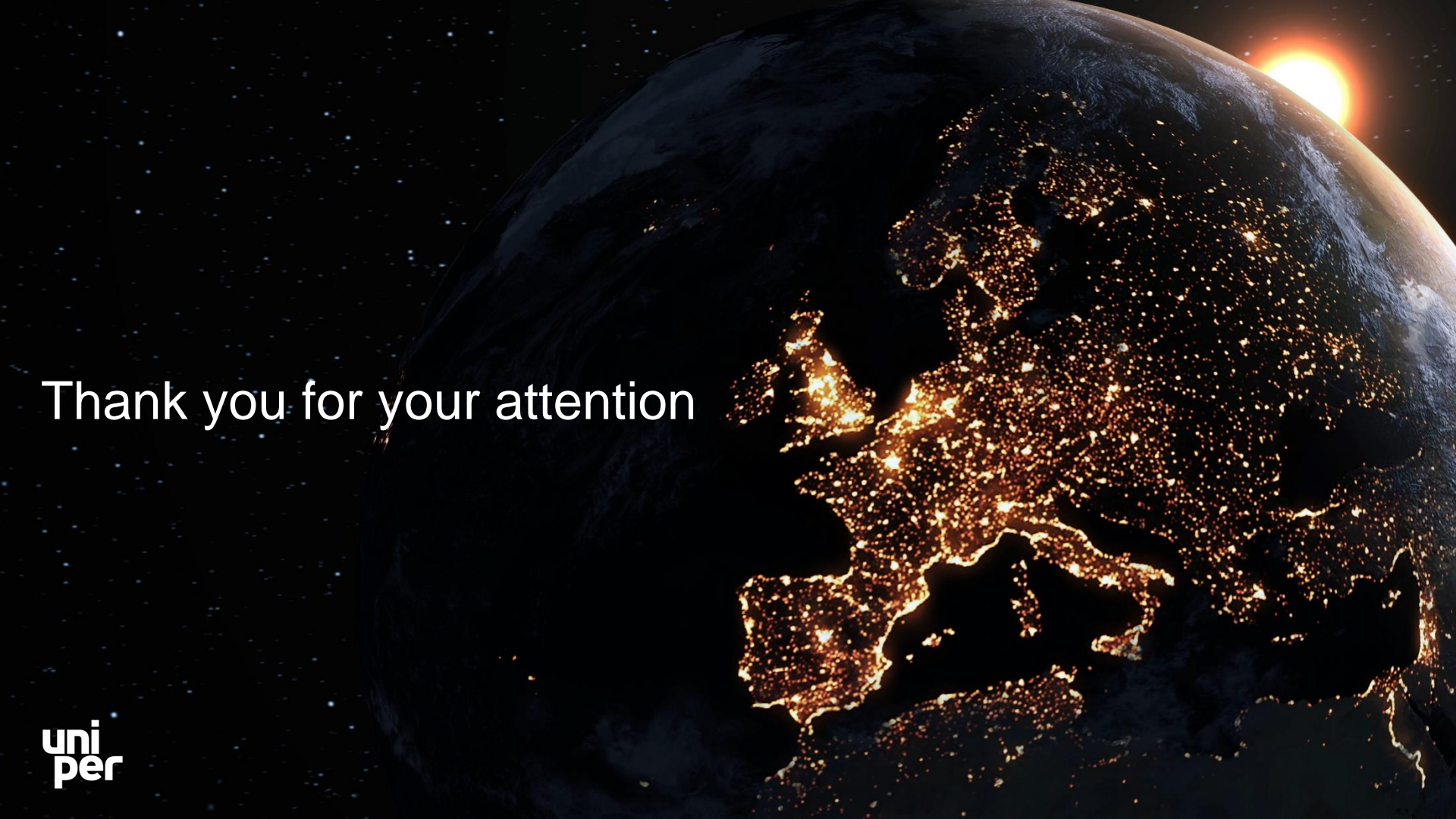
Summary



Nuclear power – a cornerstone in the Swedish electricity system providing value and stability for more than 50 years.

Uniper investigates the potential for continued operation of Oskarshamn 3 to 2065 (80 years). Conducted studies shows promising results.

We have the tools to carry out lifetime extensions, but several external factors have significant impact on the investments. Politics and market needs to cooperate to provide right conditions.



Thank you for your attention