

Dukovany
A Nuclear Power Plant Running Dry

Patricia Lorenz

Now



Soon?



Dukovany

A Nuclear Power Plant Running Dry

- construction of planned unit should start in 2029, completion in 2036. Expected operational time is 60 or even 80 years, on top of 20 years of planning and construction this project needs to take into account the effects of the climate crisis for the next 100 – 120 years.

Dukovany

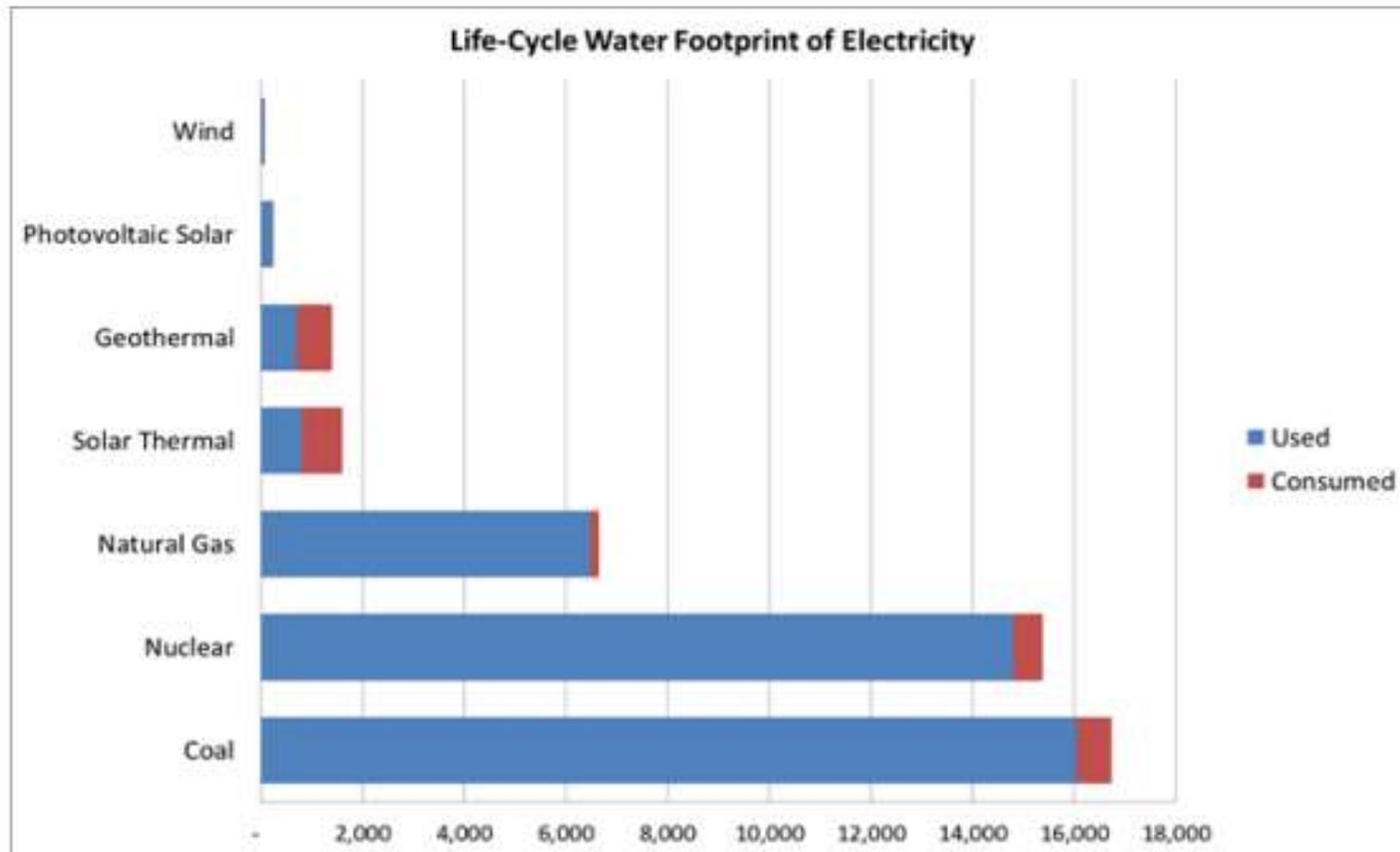
A Nuclear Power Plant Running Dry

- **Dukovany NPP** At this site currently **2040 MW** are installed. Four second generation VVER-440/213 are operating since their start-up in 1985 and 1987. The units were updated to generate 505 MWe output each and underwent a life-time extension which is valid until 2035 – 2037, resp. However, another 10 year prolongation is being discussed

Dryness

- In recent years, the public and even the politicians in the Czech Republic recognized this as one of the most urgent problems that needs to be solved.
- The Czech Republic: among the hardest hit.
- natural phenomena of less rain meets insensible agricultural practices and an energy with high water consumption

Chart 1. Lifecycle Water Use of Electricity (*Gallons/MWh*)



Political reaction and consequences

- 2003: first potential closure due to heat wave
- NPP Dukovany introduced measures to save water and is planning more (15 years later)
- Reactor with lower output

EIA

- EIA includes 0 and 2°C analyses, but also insecurities.
- It includes Annex 4 on water, but how estimates of water supply and cooling water need/MW installed was made seems to be missing

Conclusions

- Climate change-related impacts need to become a part of Environmental Impact Assessments
- severe waste of resources (funding, construction materials, times etc.) needs to be prevented already before construction starts.
- In the Czech Republic the biggest single water consumer with 40 % is energy generation. Instead of constructing another water intensive nuclear power plant, alternative sources should be considered.
- Also an important issue is whether further restrictions will imposed on other water consumers e.g. at Jihlava River to supply the NPP and whether this will be accepted in the very long run when climate crisis will hit everyday life much harder. This should be discussed in a citizen participation procedure.

NPP Beznau



Climate change

Climate change already arrived in Switzerland with the well-known effects, which can be summarized as follows:

- Drier summers
 - Heavier precipitation
 - More hot days
 - Winters with little snow
- *The near-surface air temperature has risen over the last 150 years by about 2 °C – a considerably greater increase than the worldwide average.*

NPP Beznau

- Swiss NPP is the oldest NPP in Europe (operated since 1969)
- Beznau I and II are located at the Aare River
- Cooling water for both units is taken from the Aare,
- Heat summer 2018 several days the Aare reached temperatures over 25 degrees C

NPP Beznau

- The water discharge permit for cooling water is based on a regulation from 1975.
- In 1999 a stricter water protection regulation (Gewässerschutzverordnung) was introduced. It stipulated that cooling water must not be discharged into watercourses when their temperature is above 25° C
- for NPP exceptions were made, however, since 2018 a new regulation is announced

NPP Beznau

- In 2019 the responsible Ministry (BFE) with an immediate order forced the Axpo-owned NPP to reduce output by 50% or stop operation altogether in case of 25° C, reasons being damages to fish and other aquatic life
- Axpo protested and called the measures exaggerated and insisted that the 20 years old permit is valid and refused a new discharge permit procedure
- The Ministry made clear that climate change is a **new legal situation** requiring turned this invalid and has to be re-evaluated, Axpo might even challenge new regulations in court

Climate change = new legal fact

- The Ministry made clear that climate change is a new legal situation requiring turned this invalid and has to be re-evaluated
- Axpo might even challenge new regulations in court and filed a statement for withdrawal of new discharge permit, would prefer “voluntary regulation”

NPP Mühleberg

- For Mühleberg the limit is 20,5° of Aare water temperature
- Another Swiss NPP – Mühleberg – found itself in a similar situation. Since 2015 it had to run on 80% output already as early as 2003, 2005 and 2006. For Mühleberg the limit is 20,5° of Aare water temperature. In 2015 NPP Mühleberg generated 2940 Millionen kwh, 23,6 less than in 2014. On top of NPP incidents, the reason were the high water temperatures which forced the NPP to run on 20 percent only for a total of 16 days.
- However, Mühleberg is shut-down for good

Conclusion

- Climate change a legal reason to withdraw permits
- For (not only new) NPP this should be introduced to avoid the NPP owners from refusing to lower output/shut-down plant
- Study showed that in the 2050ies nuclear and fossil fuel plants might generate up to 30% less electricity in very hot years even down by 90% (tbc)

More information on the Joint Project – Nuclear Risk & Public Control : <http://www.joint-project.org/>



The Joint Project is supported by

 Federal Ministry
Republic of Austria
Climate Action, Environment,
Energy, Mobility,
Innovation and Technology