

SGH

Warsaw School
of Economics

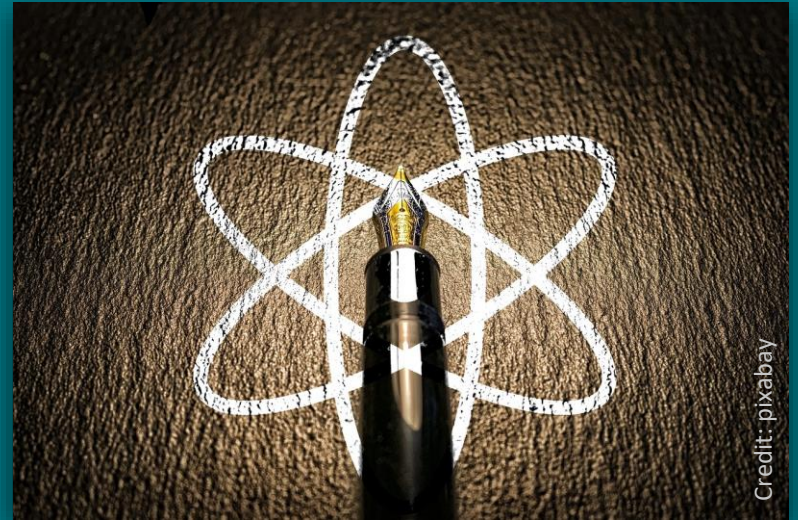
"Nuclear New Build and Business Models" online webinar
European Nuclear Society
16 June 2022

The SaHo Model for Nuclear Power

Bożena Horbaczewska, PhD,
SGH Warsaw School of Economics, Poland

Łukasz Sawicki,
Ministry of Climate & Environment, Nuclear Energy Department, Poland

**In this presentation we introduce our own opinions
which should not be taken as the position of institutions we work in**



Appropriate Business Model

Business models implemented in nuclear power so far have been:

Characterized by:

- political risk
- problems with compliance with EU regulations
- problems with low public acceptance
- high investment costs
- high investment risk and high investment risk premium
- long return on investment
- revenue risk
- market price of energy risk



Credit: pixabay

Appropriate Business Model

Business models implemented in nuclear power so far have been:

Focused on:

- ensuring stable revenues and profitability for the power plant
- providing subsidies
- tax exemptions that equals (potential) additional revenue
- NPV and IRR



Appropriate Business Model

Business models implemented in nuclear power so far have been:

If operating outside of the electricity market then:

- buying large volumes of energy through a trading company
- autoproducing energy to meet own needs



Appropriate Business Model

But still some challenges remain:

- Generally, they do not decrease electricity costs for consumers (some exceptions exist)
- Each model can be applied only to one project or a country at the most – no universal solution
- Implementation is still tricky and requires changes in legislation
- European Commission acceptance
- Public acceptance issues
- **Partial solutions to the complex problem of nuclear financing**



Appropriate Business Model

Conclusions:

- **there is a need and a space for re-thinking in the field of nuclear financing**
- **a new, fresh look at the problem is necessary**
- **an innovative business solution is required**
- **an intellectual challenge**



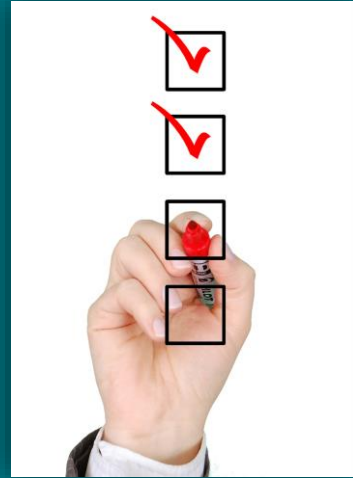
Appropriate Business Model

- Energy security – meeting the current and future demand and needs for energy in a technically and economically justified manner, while maintaining environmental protection requirements (*Energy Policy of Poland up to 2040*)
- NPP projects benefit from state support – the point of view of the whole economy: public money – public benefit
- The lowest possible price of energy for consumers



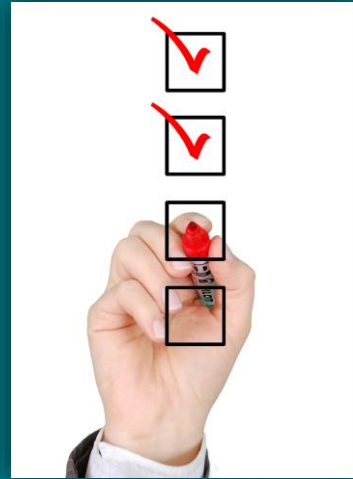
Perfect (nuclear) business model criteria [1/2]

1. **Low electricity costs for consumers;**
2. **Stability of revenues for the NPP company;**
3. **Electricity offtake;**
4. **Financing of investment with low-cost capital;**
5. **Compliance with existing and expected EU regulations and policies (applicable to the EU Member States);**
6. **Possibility to implement it in a fast and easy way (i.e., using existing regulations);**



Perfect (nuclear) business model criteria [2/2]

7. **Public acceptability;**
8. **Transferring part of the risk to the State in the short run;**
9. **Limiting of the financial burden to the State budget and public finances in the long run;**
10. **Business flexibility from the investor's point of view;**
11. **Long-term state engagement in nuclear power development;**
12. **Applicability to various nuclear projects in different legal systems;**



International Journal of Management and Economics, 2021; 57(4): 343–359

- <https://www.researchgate.net/publication/355212173> Role of the state in implementation of strategic investment projects The SaHo Model for nuclear power
- <https://www.sciendo.com/article/10.2478/ijme-2021-0020>

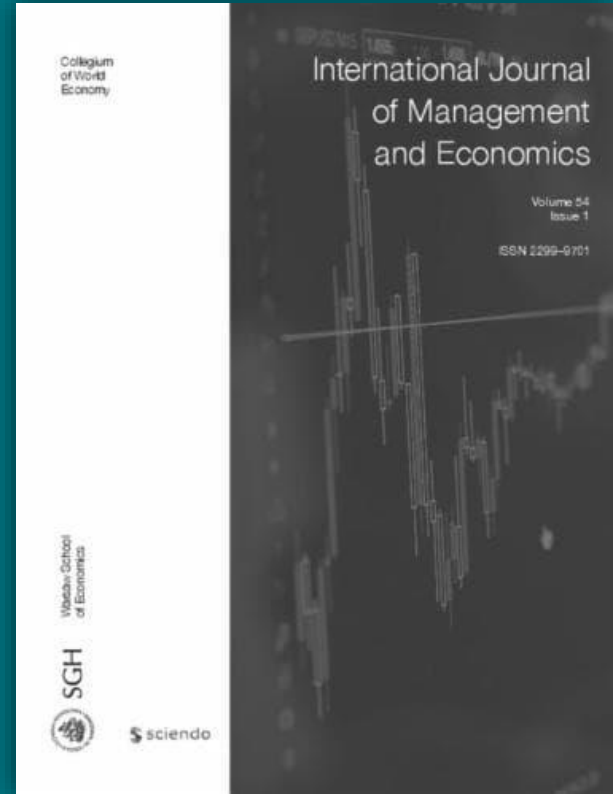
Role of the state in implementation of strategic investment projects: The SaHo Model for nuclear power

Łukasz SAWICKI

Ministry of Climate & Environment, Nuclear Energy Department

Bożena HORBACZEWSKA

SGH Warsaw School of Economics, Department of Economics II



The SaHo Model – short description

- The name of the Model comes from our surnames: **Sawicki-Horbaczewska**
- The State builds an NPP and sells it to the electricity consumers. From then on they offtake the electricity generated in their own NPP at production cost.
- It's a state initiated (and optionally controlled) private cooperative of end-users. Energy companies also are possible, though as a last resort.
- The SaHo Model uses 100-years-proven mechanisms of similar co-op models like Polish industrial power (autoproducers), US co-ops and Finnish *Mankala*.

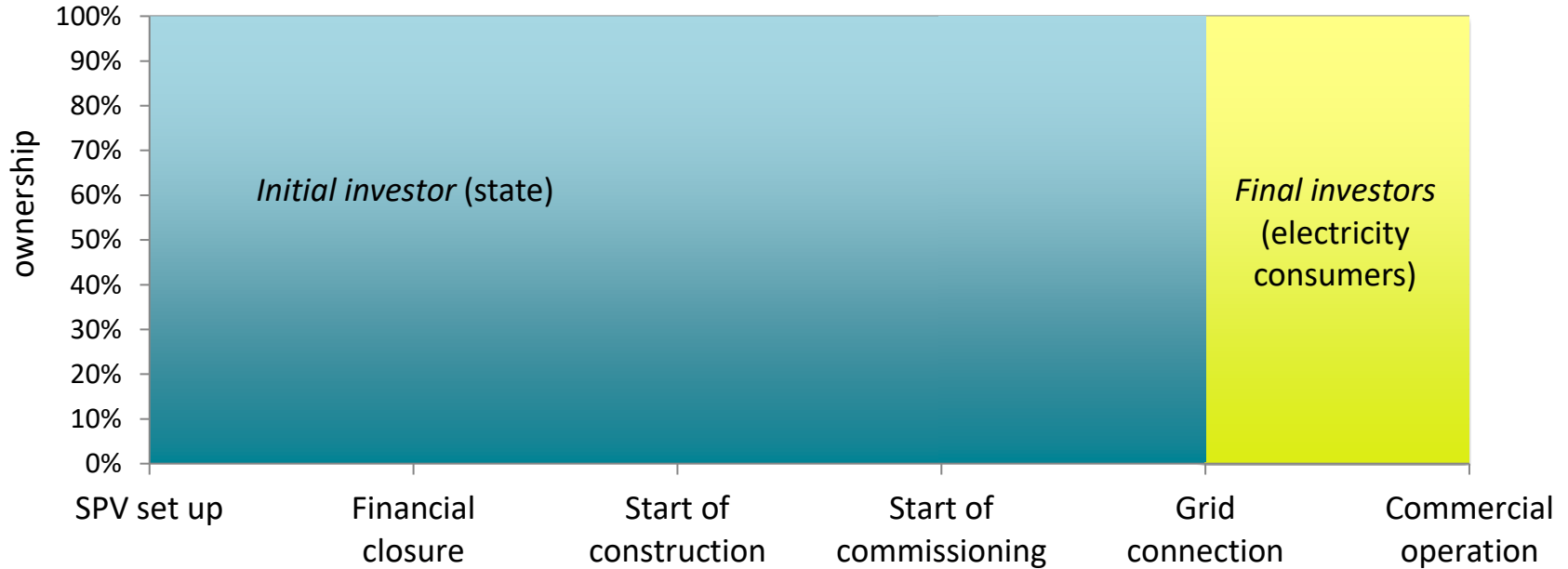


Credit: fauxels/Pexels

The SaHo Model: pre-basic concept

- The nuclear SPV (named: SaHo NPP) is created by the so called **initial investor**, which is a state-controlled company, investment fund etc.
- *Initial investor* organizes the whole investment process including financing and **takes over all kinds of risk** that can be efficiently managed by the government (political, regulatory, economic etc.).
- In our pre-basic concept, the *initial investor* **sells its shares to electricity consumers (final investors)** just before the grid connection. From then on, they have the **right and obligation to offtake the electricity and cover all the production costs**, like in Polish industrial power (autoproducer), the American public power and co-ops, the Finnish Mankala, or even a German renewable co-op model.

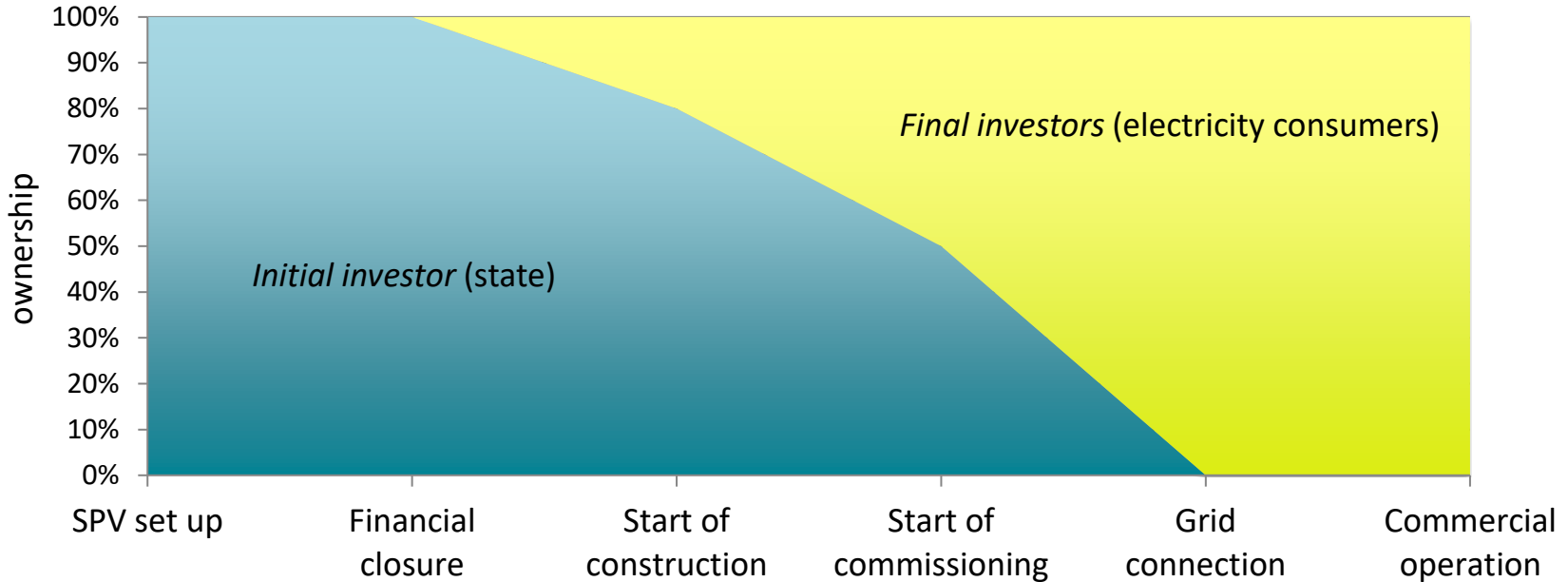
The SaHo Model: pre-basic concept



The SaHo Model: basic concept

- In our basic concept in the period between the establishment of the project company and connection to the grid, the *initial investor* **gradually sells its shares to electricity consumers** (*final investors*). The closer to the project completion, **the lower project risk**. This can be discounted in the share price – the lowest at the beginning and the highest just before the grid connection, but still attractive to the potential *final investors*.
- *Initial investor* leaves the project with the last tranche of shares sold, before the grid connection.

The SaHo Model – basic concept



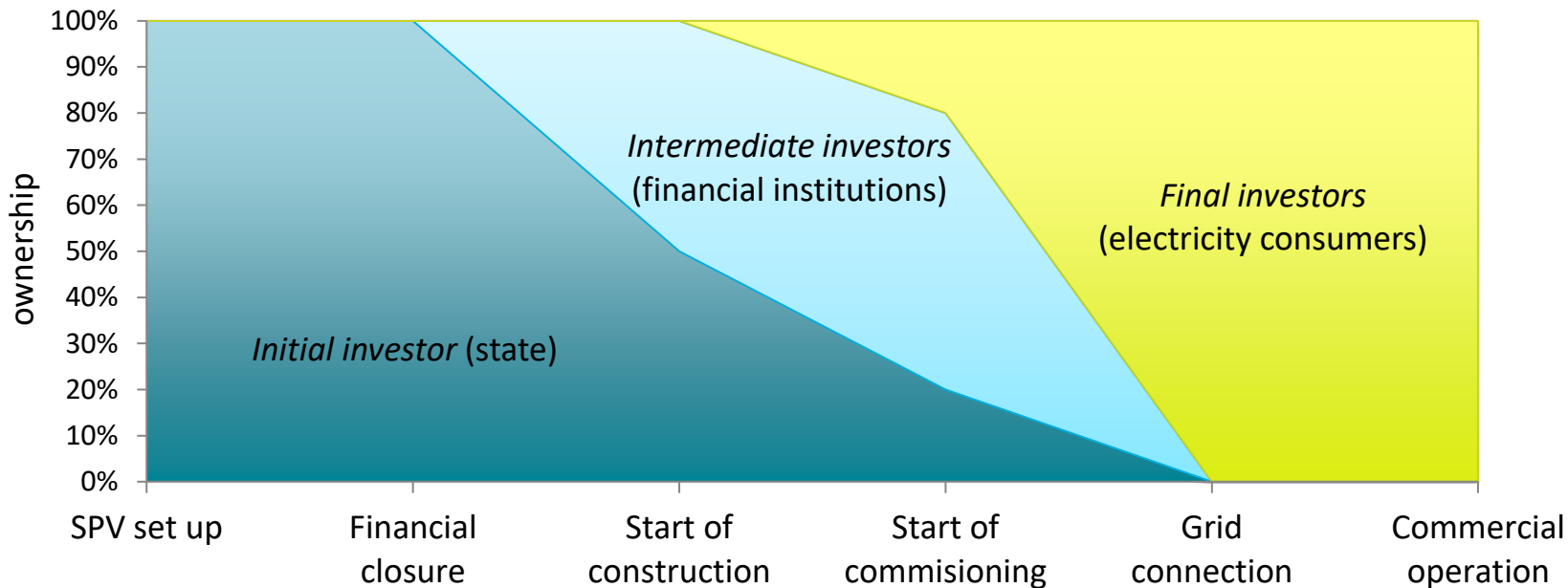
The SaHo Model: intermediate investor

Initial investor is allowed to sell SaHo NPP shares to **intermediate investors** (financial institutions) at subsequent stages of the investment project (on market, non-discriminatory terms, with boundary conditions). However, the more advanced the project implementation, the lower the risk and the higher the selling price of these shares.

Also, in this version of the SaHo Model, funds raised from the sale of these shares may be used to finance the construction of further nuclear units – **money recycling**.

Intermediate investor must sell SaHo NPP shares to the *final investors* (electricity consumers) before the grid connection, because the shareholder is obliged to offtake the electricity. The state can guarantee its right to oversee these transactions.

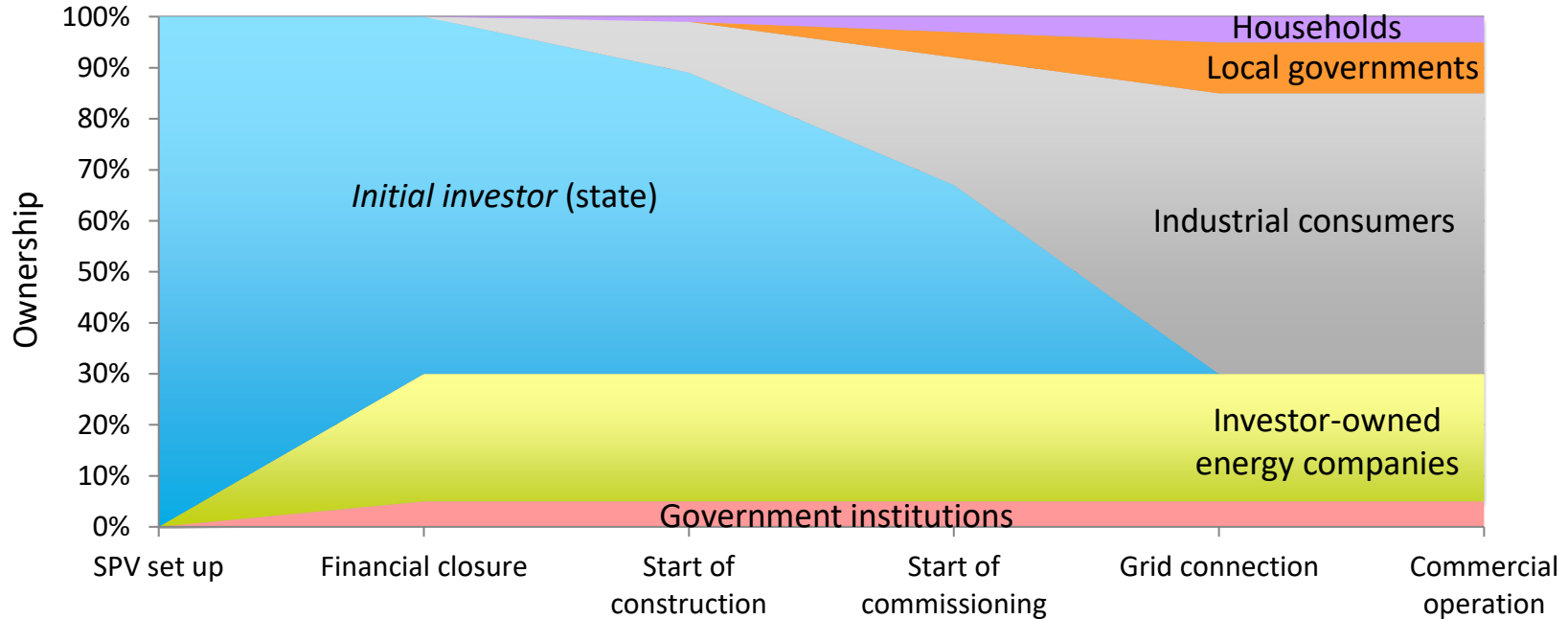
The SaHo Model – intermediate investor



The SaHo Model – types of shareholders

- **Industry, transport, commerce;**
- **Local governments** – similar to US and European public power companies owned by local governments;
- **National government institutions** (state agencies, law enforcement institutions, State Fire Service etc.);
- **Households** – through dedicated energy cooperatives (like US co-ops or renewable co-ops in Germany);
- **Investor-owned energy companies** – to the extent not distorting the idea of the model or as a last resort;
- Final investor is **allowed to trade in shares**, with limitations due to the national security, state control or for technical reasons (minimum ownership period);
- Instruments of **state control** over the NPP – according to the applicable national laws and regulations.

The SaHo Model – types of shareholders



Advantages of the SaHo Model [1/2]

1. Allows for significant decrease of the electricity costs for consumers;
2. Hedges against the electricity price risk for consumers in both short- and long-term;
3. Operates in a specific area of electricity market (in its broadest sense) and thus is not vulnerable to most of its challenges;
4. Ensures the electricity offtake;
5. Provides stable revenues for the NPP company;
6. Complies with existing and expected EU regulations and policies (applicable to the EU Member States);
7. Allows to finance the investment with lowest possible cost of capital;
8. Increases public acceptability and support for nuclear power;

Advantages of the SaHo Model [2/2]

9. Can be implemented in a fast and relatively straightforward way (i.e., using existing regulations);
10. Transfers part of the risk to the state in the short run;
11. Limits the financial burden to the state and public budgets in the long run (money recycling);
12. Allows for business flexibility to investors;
13. Enables long-term state engagement in nuclear power development;
14. Can be applied to various nuclear projects in different legal systems;
15. Supports reindustrialization, competitiveness and improves economic conditions (including limiting of the inflation);
16. Maximizes the use of national capital, while not negatively impacting the economy of the nuclear project.

Our activities in Poland and abroad

The SaHo Model has been presented and debated on national and international conferences (including in the Polish Senate, universities and IAEA).

Positive opinions from financial experts, power sector managers and international financial institutions as well as from NGOs – both Polish and foreign.

There is already an interest of the SaHo Model, declared by Polish industry and large cities, as well as by one foreign government.



Nuclear conference at the University of Warsaw



The SaHo Model presentation in the Polish Senate



Thank you!