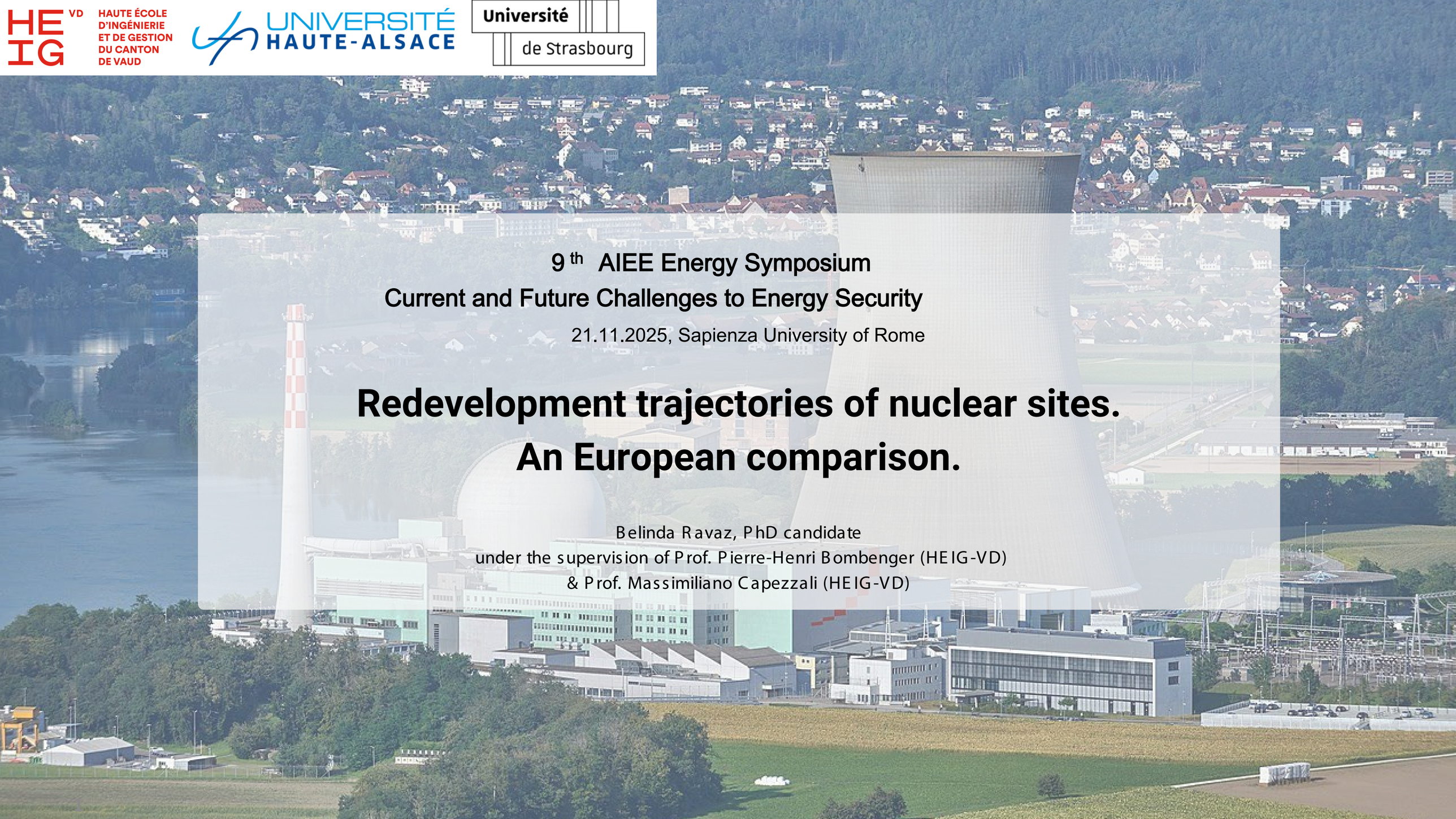


9 th AIEE Energy Symposium

Current and Future Challenges to Energy Security

21.11.2025, Sapienza University of Rome

Redevelopment trajectories of nuclear sites. An European comparison.

Belinda Ravaz, PhD candidate
under the supervision of Prof. Pierre-Henri Bombenger (HEIG-VD)
& Prof. Massimiliano Capezzali (HEIG-VD)

OUTLINE

Introduction

Research question

Methodology

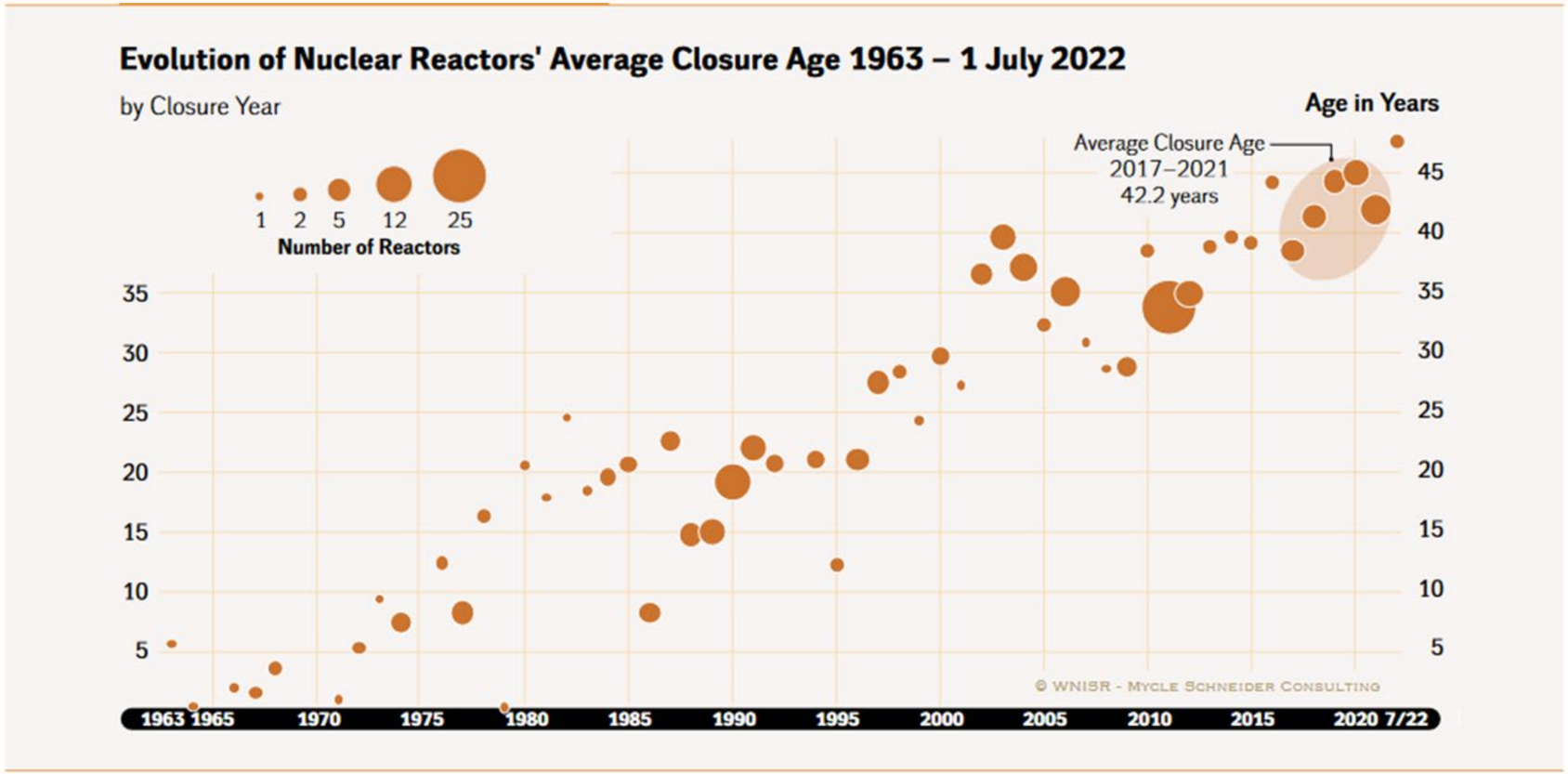
Results

Conclusion

INTRODUCTION

CONTEXT

408 Reactors in operation (01.2025)

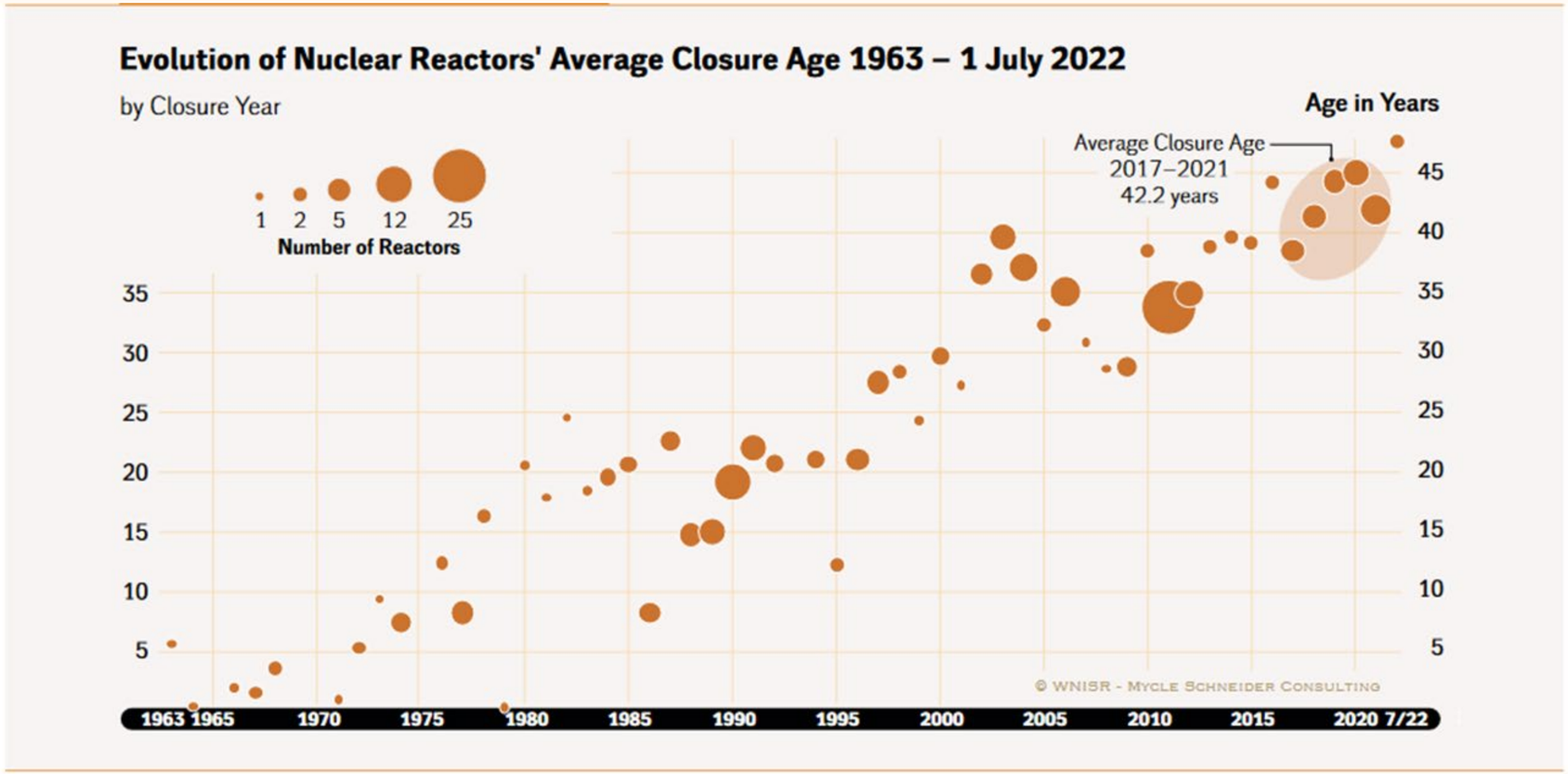


Sources: WNISR, with IAEA-PRIS, 2022

CONTEXT

408 Reactors in operation (01.2025)

190 Shutdown reactors (01.2025)



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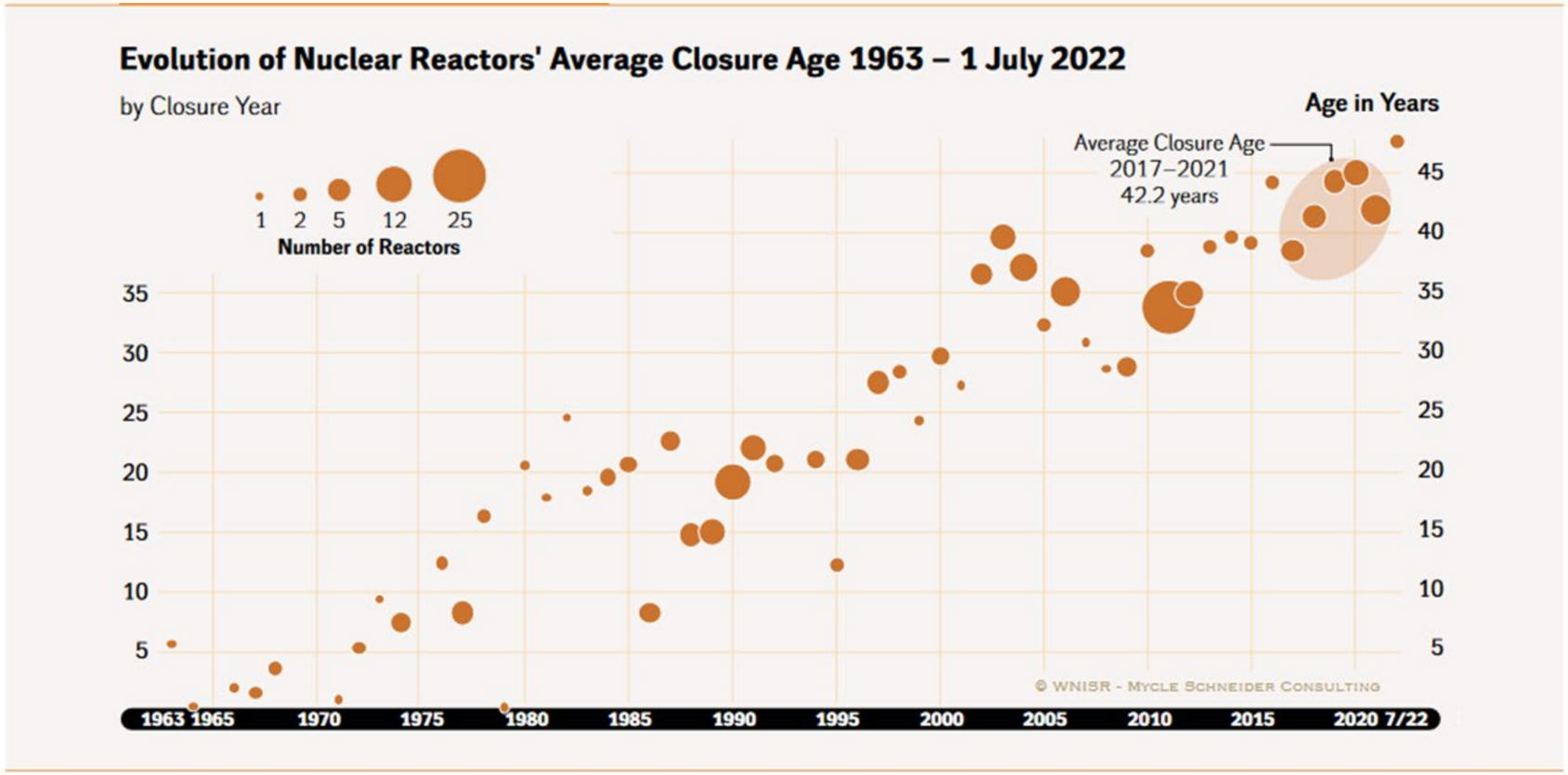
43.5 Average age of a reactor on closure between 2018 and 2022



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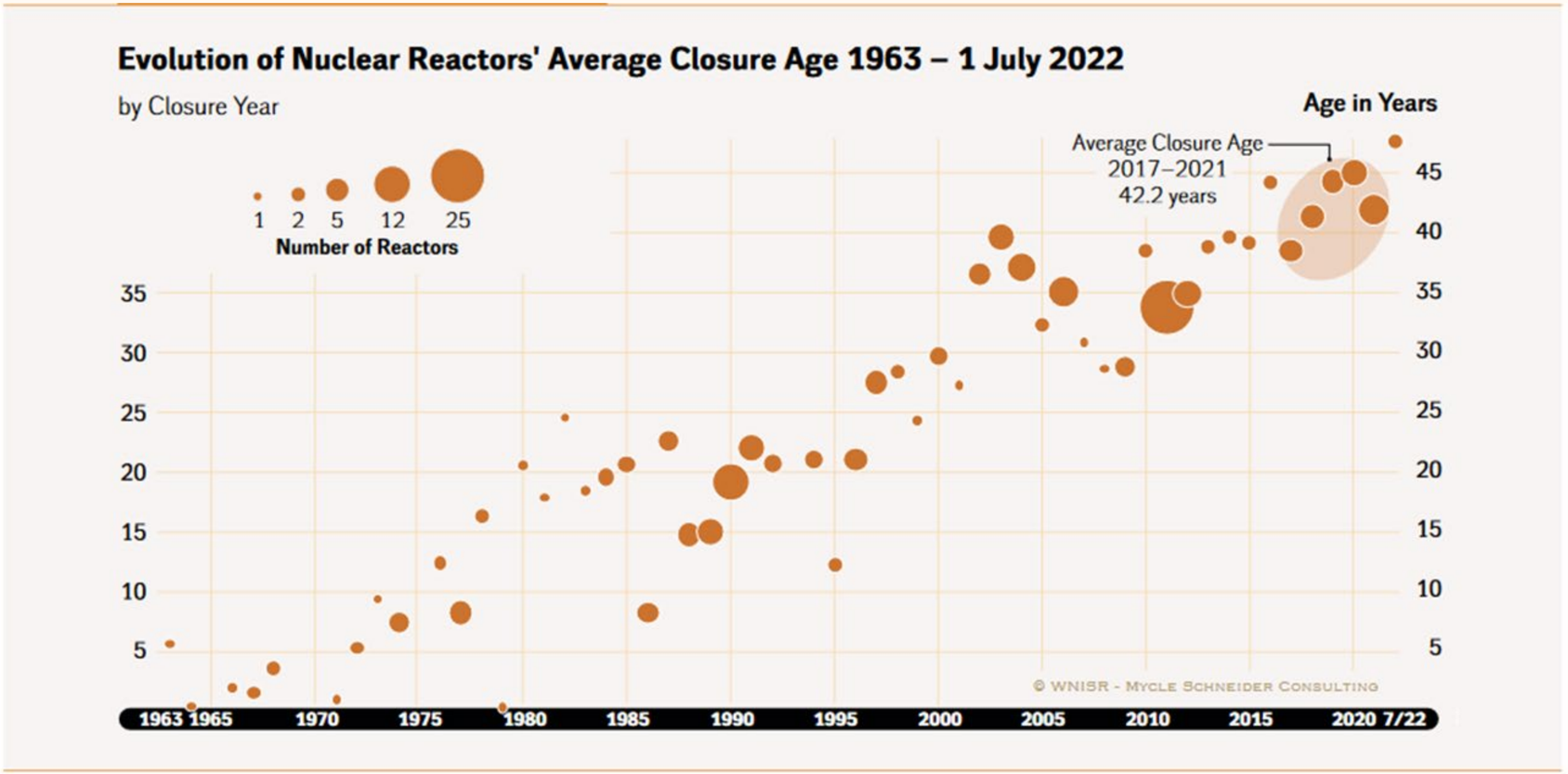

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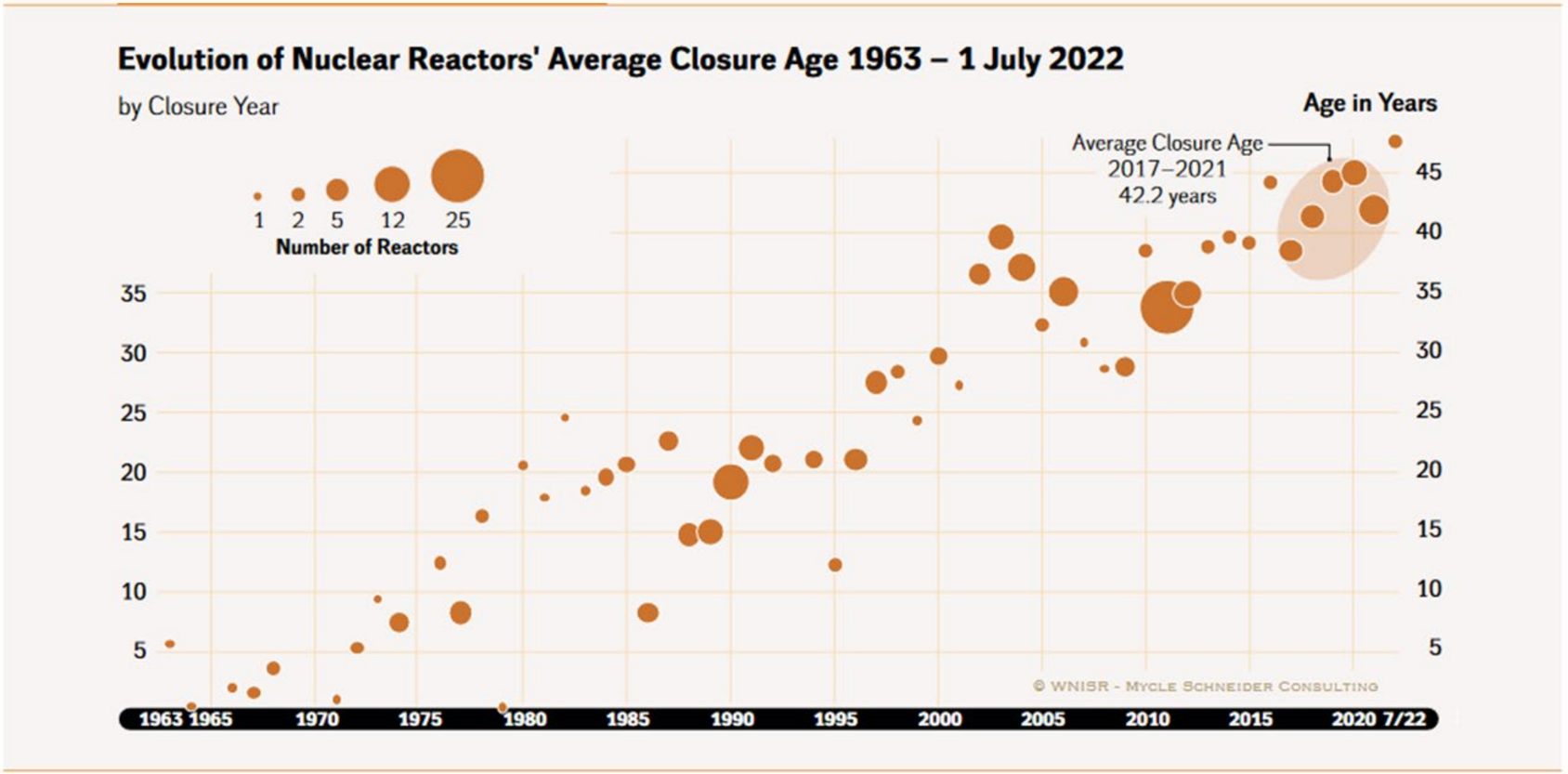
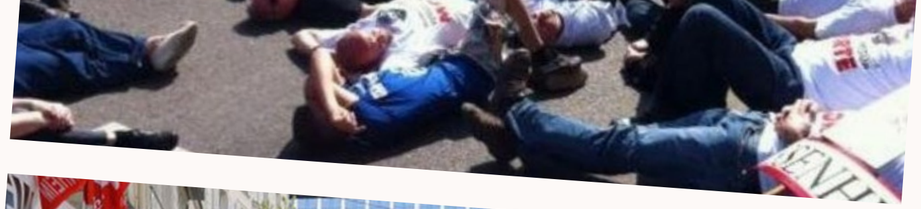


Sources: WNISR, with IAEA-PRIS, 2022

→ usual to shut down reactors
→ novelty : closure of entire nuclear power stations


charbon
#vandalismeenvironnemental

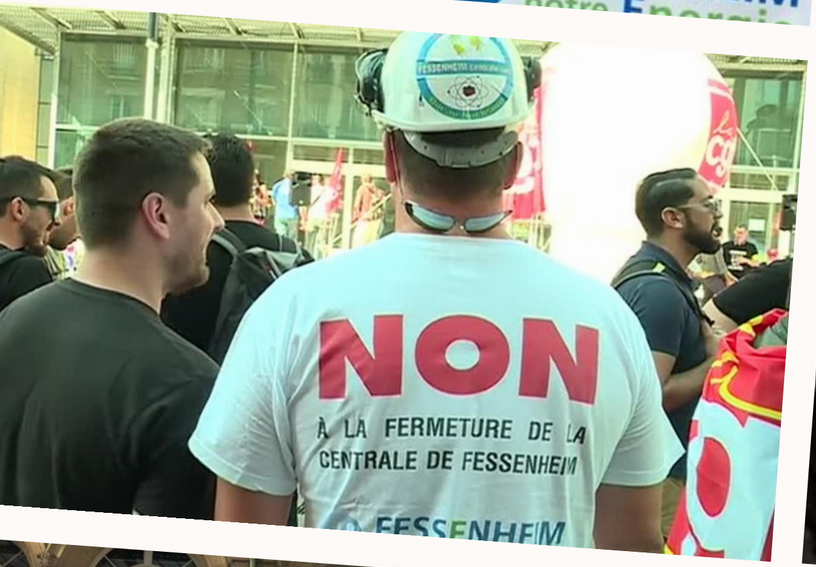



FESSENHEIM


NON A LA FERMETURE
DE LA CENTRALE
NUCLEAIRE
FESSENHEIM


ASSOCIATION DES
ÉCOLOGISTES
POUR LE NUCLÉAIRE
FESSENHEIM
2200 Emplois
sacrifiés

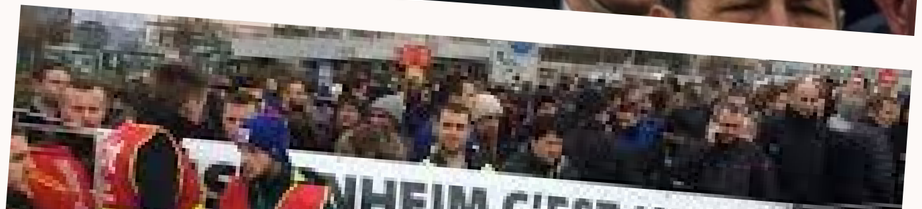

NON A LA FERMETURE DE LA CENTRALE
NUCLEAIRE DE FESSENHEIM !


NON
À LA FERMETURE DE LA
CENTRALE DE FESSENHEIM


ASSASSINER
2200
EMPLOIS
=
CRIME
D'ETAT


NON !
à la fermeture de Fessenheim


Voix du Nucléaire



RESEARCH QUESTION

RESEARCH QUESTION

What explains the different territorial responses to nuclear plant closures?

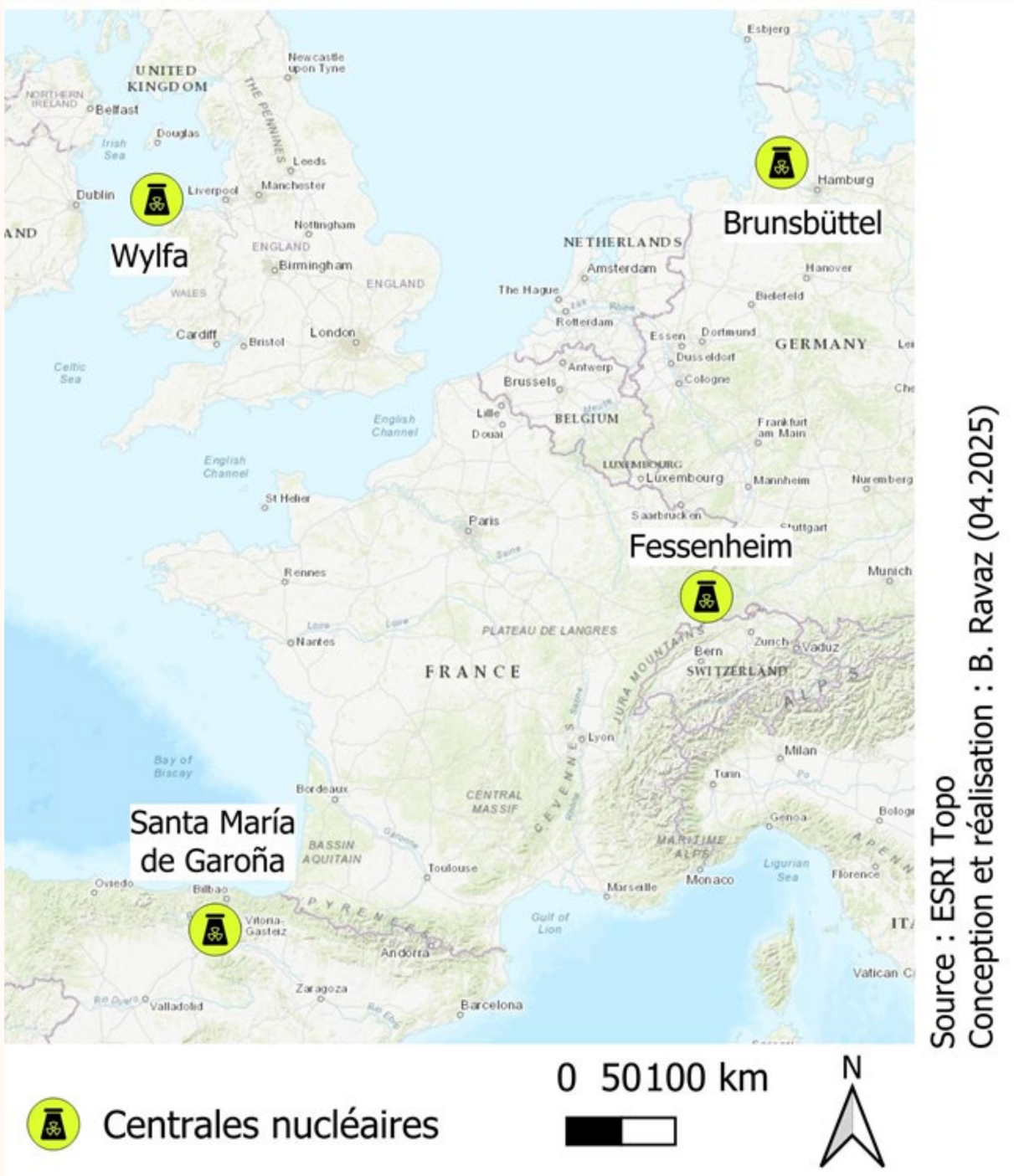
METHODOLOGY

Research process

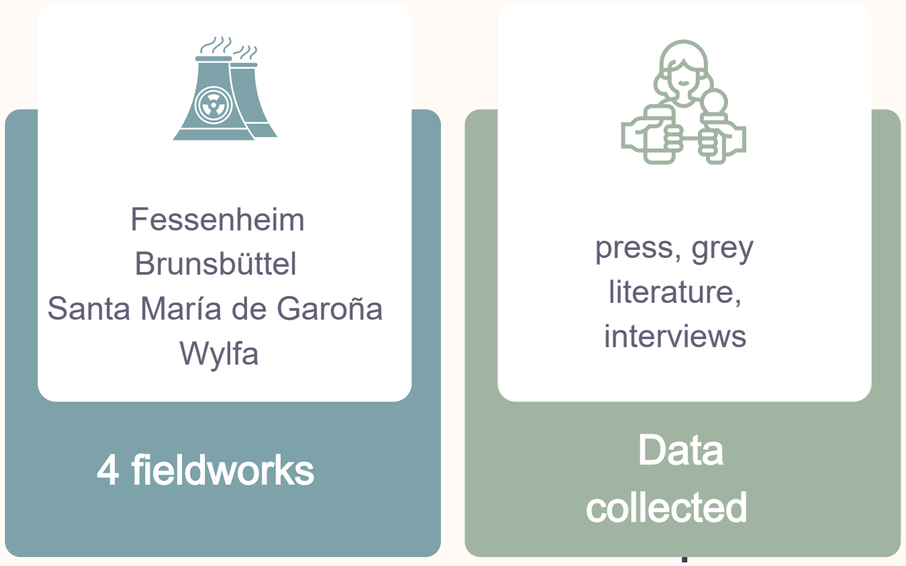
Fieldworks presentation

A comparative approach

- Fessenheim, France
- Brunsbüttel, Germany
- Santa María de Garoña, Spain
- Wylfa, United Kingdom



Research process



Data collected

	Press	Grey literature	Interviews
Fessenheim	**661** (2012 - 2023)	**19**	**8** (2021)
Brunsbüttel	**597** (2007 - 2023)	**7**	**6** (2024)
Santa María de Garoña	**656** (2009 - 2024)	**10**	**5** (2024)
Wylfa	**3191** (2006 - 2025)	**20**	**9** (2025)

Research process

Fessenheim
Brunsbüttel
Santa María de Garoña
Wylfa

4 fieldworks

press, grey literature, interviews

Data collected

reconstruction of the redevelopment process

Narratives

Research process

Fessenheim
Brunsbüttel
Santa María de Garoña
Wylfa

4 fieldworks

press, grey literature, interviews

Data collected

reconstruction of the redevelopment process

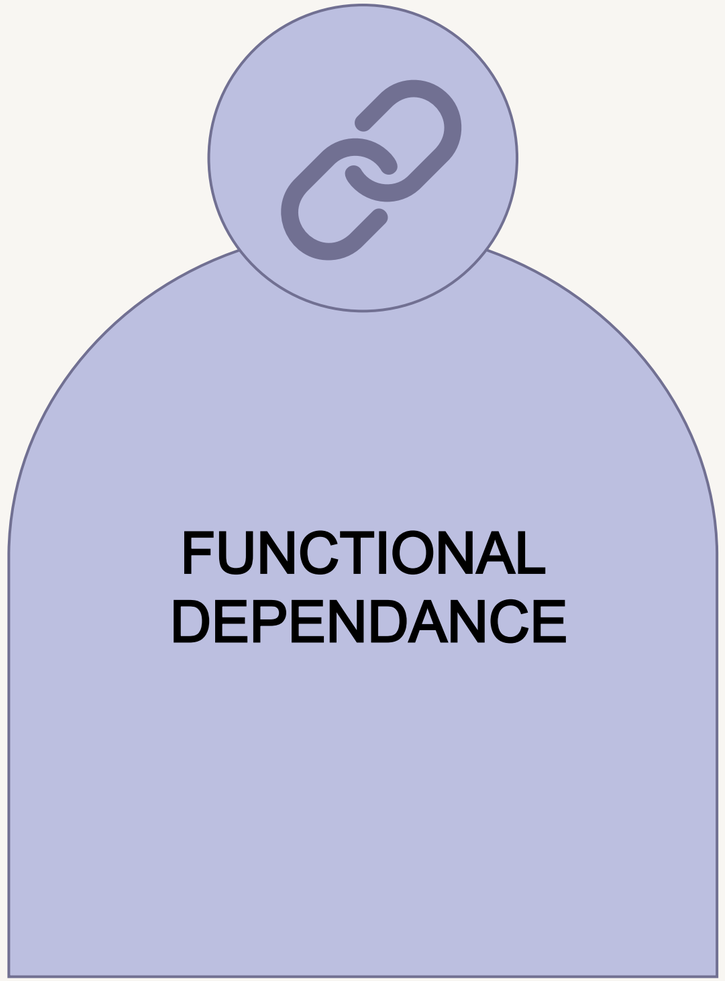
Narratives

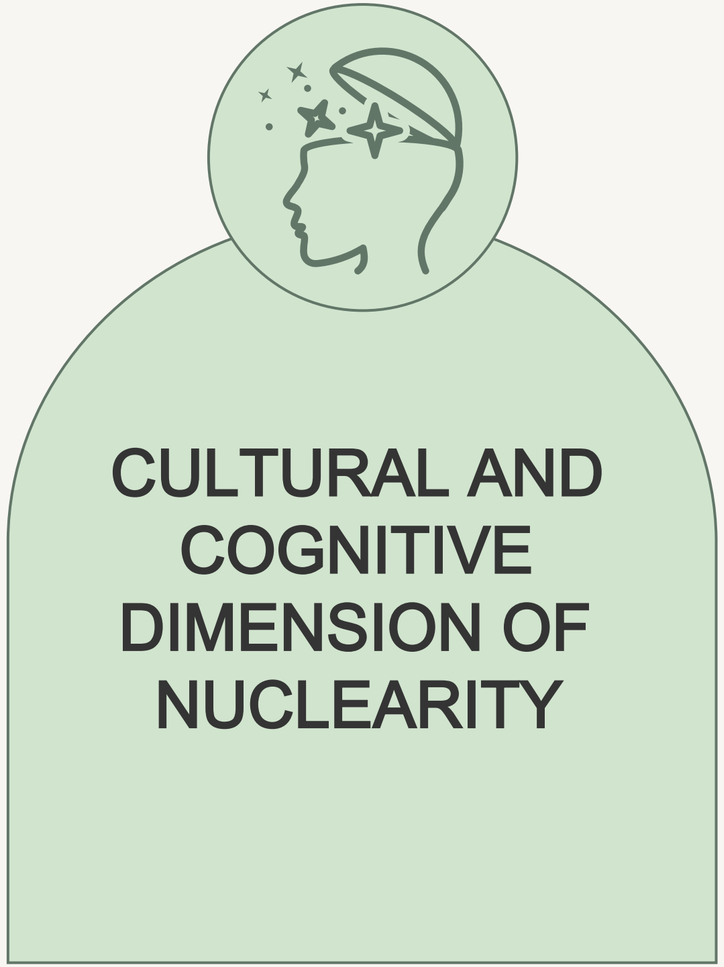
3 dimensions influencing trajectory

Fieldwork analysis

RESULTS

Three dimensions





FUNCTIONAL DEPENDENCE

	Wylfa & Fessenheim	Santa María de Garoña	Brunsbüttel
Socio - economic factors	high impact	medium impact	low impact
Spatial factors	highly peripheral (Wylfa) medium peripheral (Fessenheim)	highly peripheral	industrial area close to major urban centers

ChemcoastPark at Brunsbüttel

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ChemcoastPark at Brunsbüttel

→ the higher the functional dependence, the greater the tendency to return to a nuclear pattern

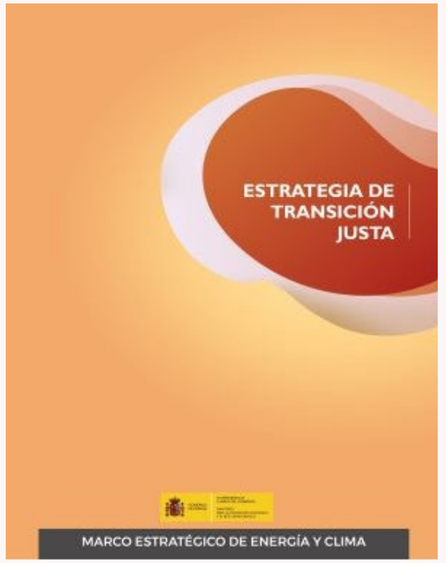
GOVERNANCE OF DECOMMISSIONING AND REDEVELOPMENT

FESSENHEIM

- centralized governance
- the government takes the lead and selects the actors involved

SANTA MARÍA DE GAROÑA

- decentralized governance
- the state as a resource for the territory



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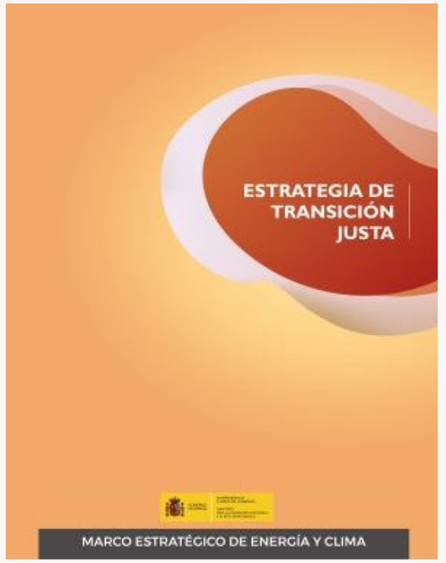

→ The degree of local autonomy and capacity to navigate institutional scales determines whether territories can shape their own redevelopment trajectory.

CULTURAL AND COGNITIVE DIMENSION OF NUCLEARITY

FESSENHEIM & WYLFA

- everyday normality
- strong symbolic attachment
- perpetuating the nuclear legacy

BRUNSBÜTTEL

- German cultural rejection
- “Bis zur Grünen Wiese”
- symbolic greenfield

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→ Cultural and cognitive dimensions of nuclearity shape how territories approach their post -closure redevelopment strategies.

3 TYPES OF TRAJECTOIRES

Trajectories	Inheritance trajectory with active compensation	Adaptation trajectory with partial compensation	Gradual phase-out trajectory
Sites	Fessenheim & Wylfa	Santa María de Garoña	Brunsbüttel
Funcional dependance	strong	medium	low
Perception of nuclear	positive	distant	negative
Redevelopment objective	Redevelopment project linked to nuclear heritage	Promotion of local characteristics (agricultural and touristic)	Complete erasure of the nuclear legacy

CONCLUSION

CONCLUSION

Understanding these mechanisms is essential to effectively support these territorial transitions.

Fessenheim, France @Adobestock

HE VD HAUTE ÉCOLE D'INGÉNIERIE ET DE GESTION DU CANTON DE VAUD

UNIVERSITÉ HAUTE-ALSACE

Université de Strasbourg

THANK YOU

belinda.ravaz@ heig-vd.ch