

VERONICA

Versatile European Reactor for Neutron Irradiation and Nuclear Research

Project update: Stakeholders, Utilization and Preliminary design



A. Pungerčič^{1,2}, B. Levpušček^{1,2}, J. Malec^{1,2}, K. Ambrožič^{1,2}, V. Radulović^{1,2}, I. Tiselj^{1,2}, N. Thiollay³, G. Bignan³, C. Destouches³, R. Jacqmin³, X. Wohleber⁴, A. Lyoussi³, J.F. Villard³, and L. Snoj^{1,2}

¹Jožef Stefan Institute, Jamova cesta 39, 1000 Ljubljana, Slovenia

²Faculty of Mathematics and Physics, University of Ljubljana, Jadranska ulica 19, 1000 Ljubljana, Slovenia

³CEA, DES, IRESNE, Cadarache F-13108 Saint-Paul-Lez-Durance, France

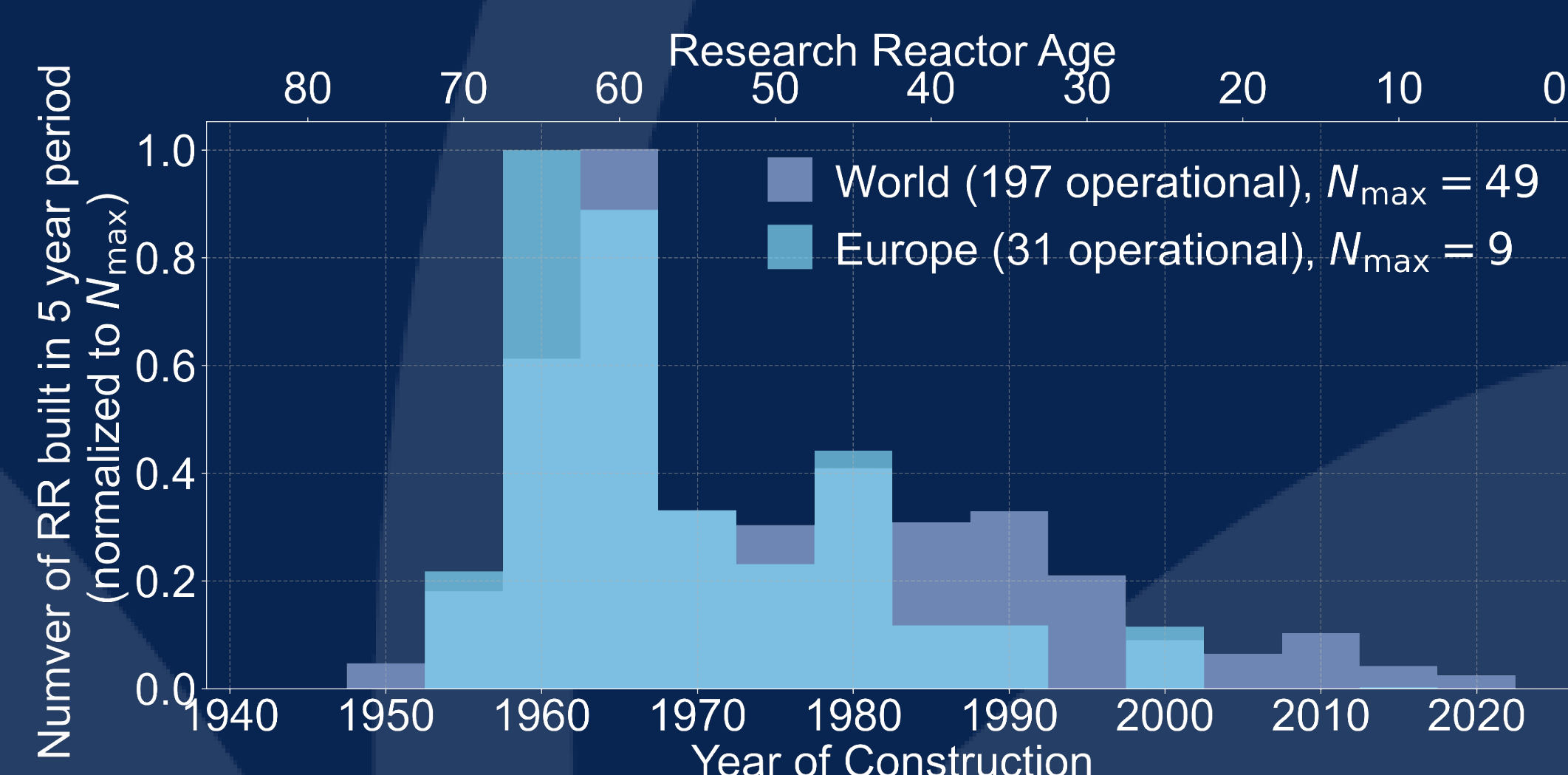
⁴CEA, DRF, IRFU, F-91190 Saclay, France

MOTIVATION

- Develop a roadmap for a **new European research reactor in Slovenia**
- Address the **decline of research reactors**
- Support **Europe's transition to a zero-carbon society**
- Aligned with **Draghi report**, **UN sustainable goals** and **EU competitiveness compass** and **nuclear energy goals**: long-term reactor operation and new NPP, SMR and fusion energy developments



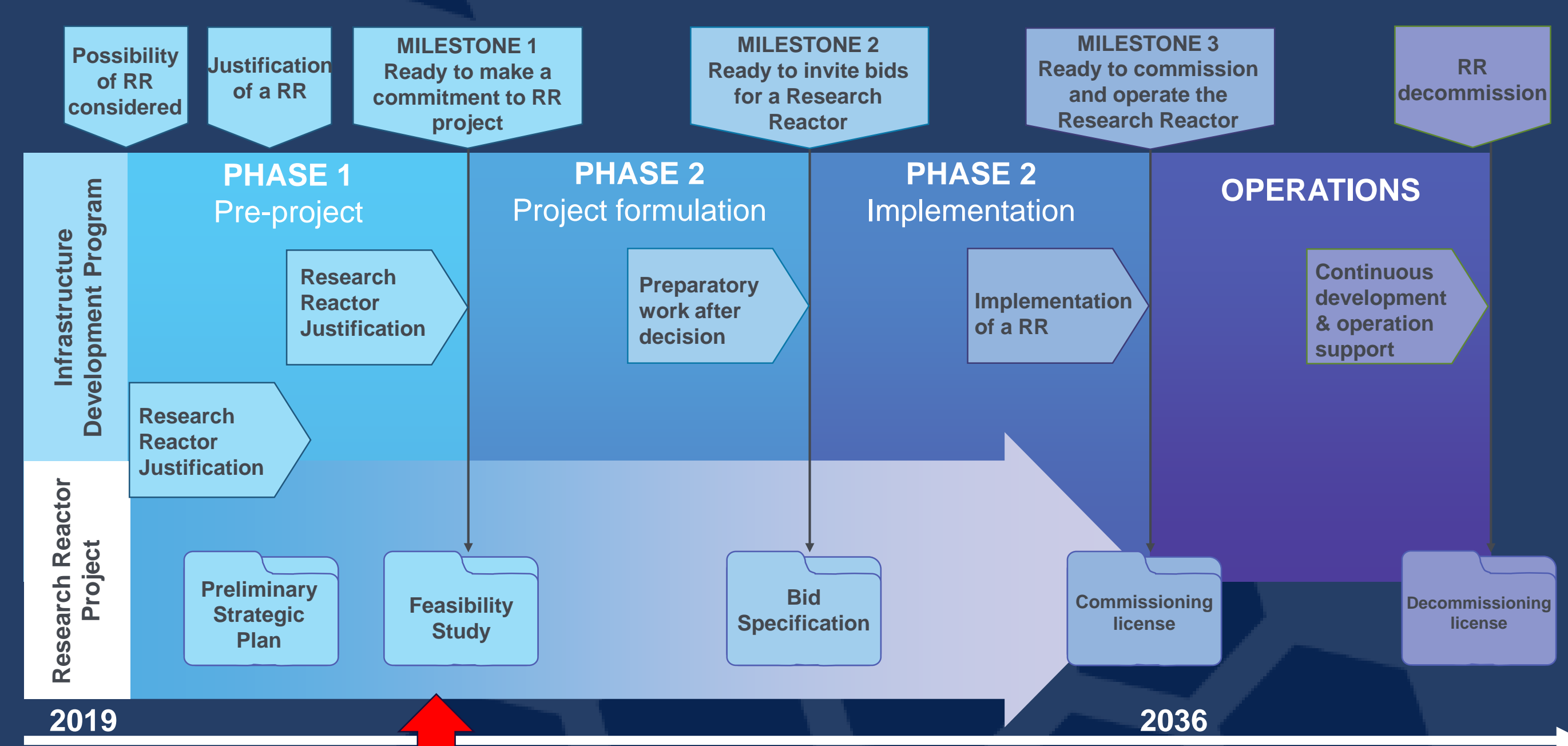
REPowerEU



	Europe	World
# of operational RR	31	197
Average age [years]	59	51

PRELIMINARY DESIGN & TIMELINE

- Complementary to Europe's existing and emerging highly specialized research facilities – JHR, IFMIF-DONES, PALLAS, ESS and MYRRHA.
- Two reactor co-location strategy (sharing support infrastructure):
 - Compact 5 MW pool-type multi-purpose research reactor
 - Zero power research reactor
- Fuel flexibility by allowing partial core replacements in both MPRR and ZPR
- Ability of neutron spectrum tailoring and establishment of a multi-physics loops



STAKEHOLDERS AND UTILIZATION

ZPR Stakeholder–Utilization Matrix

Government and regulatory bodies	24	1	12	7
International research collaborations and networks	14	2	1	2
Universities	13	4	4	2
Research institutions	21	6	7	6
Healthcare and medical research institutions	1	0	0	2
Industry and private sector	7	2	2	0

Public outreach, education & training
Instrumentation dev. & validation
Support for reactor design, safety & code validation
Nuclear data & benchmark experiments

MPRR Stakeholder–Utilization Matrix

10	1	7	8	0	0	7	2	7
12	1	1	2	0	1	0	2	1
9	1	1	2	2	0	2	0	2
16	4	3	5	2	4	7	7	13
3	0	0	0	1	2	3	2	4
6	4	2	0	0	2	1	10	0

Public outreach, education & training
Instrumentation dev. & validation
Support for reactor design, safety & code validation
Nuclear data & benchmark experiments
Specialised industrial & medical applications
Isotope production & neutron source
Radiochemistry & radiation chemistry
Material testing & radiation effects
Neutron beam applications

We are here

Number of identified utilizations and stakeholder

One facility – Two reactors

Multi-purpose research reactor (MPRR)



Zero-power research reactor (ZPR)

We invite all interested institutions and experts to engage with the VERONICA initiative and contribute to shaping a shared research platform that supports Europe's scientific, industrial, and strategic objectives.



NENE



FMF

UNIVERSITY OF LJUBLJANA
Faculty of Mathematics and Physics



Institut
"Jožef Stefan"
Ljubljana, Slovenija

