

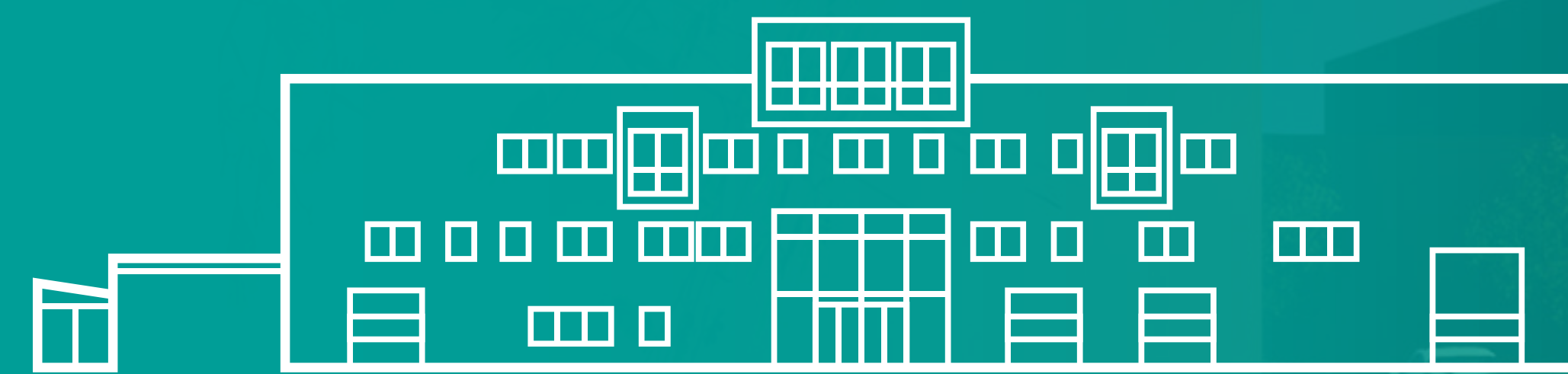


VSB TECHNICAL
UNIVERSITY
OF OSTRAVA

ENERGY
AND ENVIRONMENTAL
TECHNOLOGY CENTRE

PROMOTING RESEARCH AND INNOVATION IN HYDROGEN: OPPORTUNITIES FOR COOPERATION BETWEEN THE EU AND JAPAN

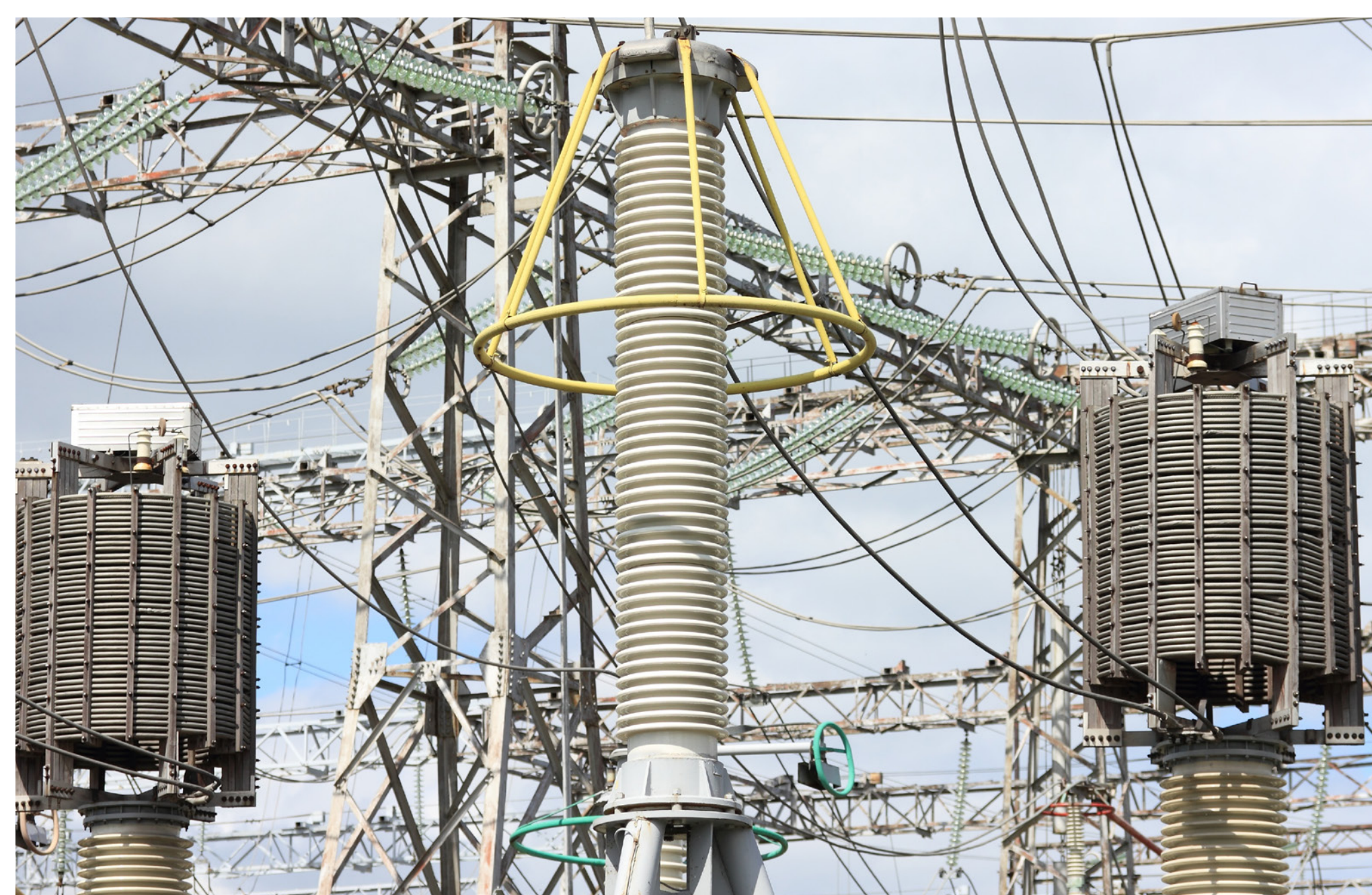
Stanislav Mišák





VISION

CEET aims to build a recognized university institute focused on developing new technologies and materials for low-carbon and sustainable energy and environmental technologies in line with the principles of circular economy, which is open to cooperation on current and strategic projects at the national and international level.



MISSION

We offer sharing of our unique laboratory base with knowledgeable experts for research, development and education of students at all levels of study. We are open to cooperation with partners from the public sector, application sphere, universities and research organizations at the national and international level.



STRATEGY

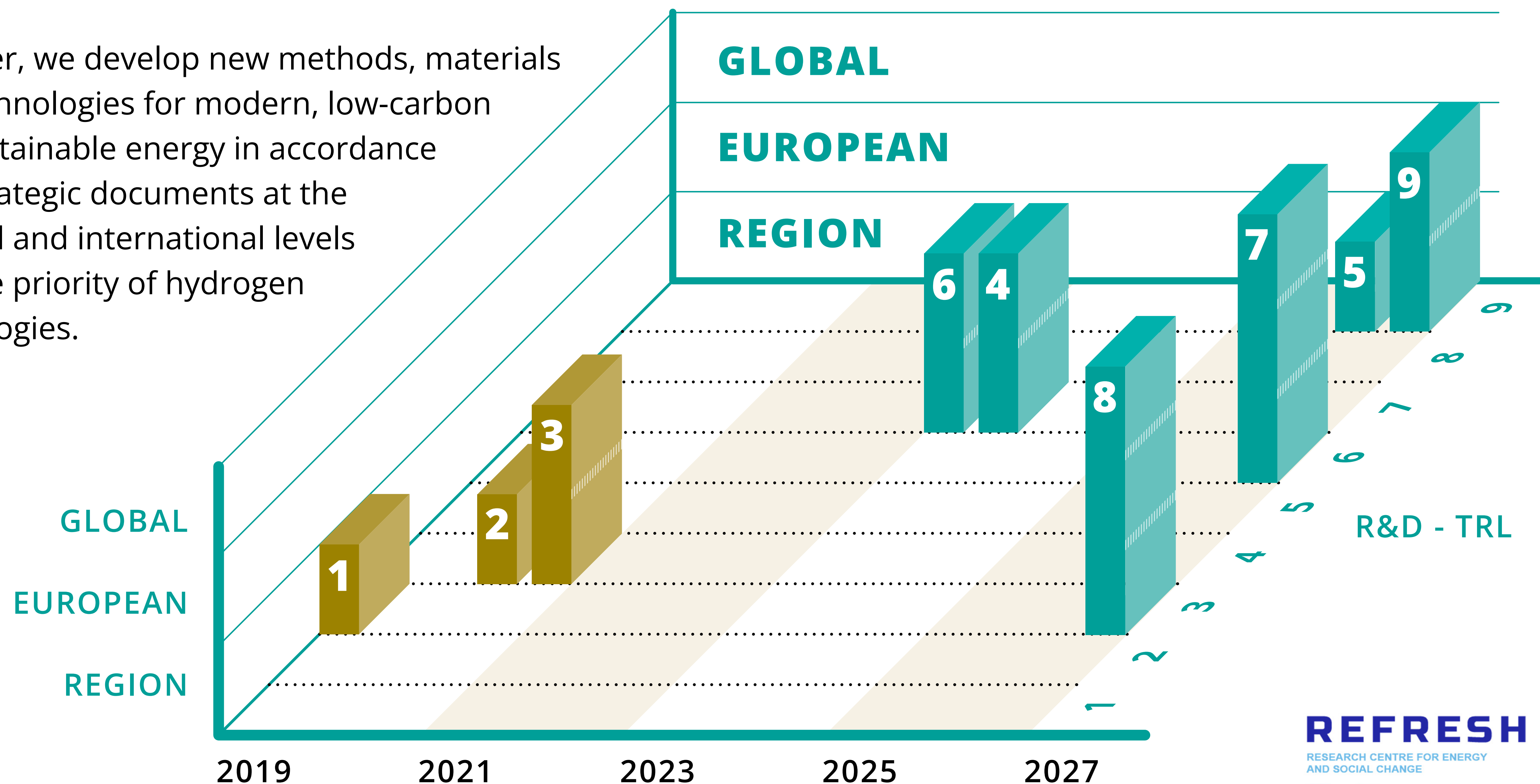
All CEET activities are coordinated to meet priorities from the regional to the international level in accordance with strategic documents with a strong emphasis on cooperation between the research and application spheres.





- 1 MS Innovation strategy
- 2 MS Impact study for decarbonization
- 3 MS Energy conception
- 4 National Centre for Energy
- 5 **Public H2-Filling Station 1000 kg/day (realization)**
- 6 R&D H2-Filling Station 100 kg/day
- 7 **Test polygon for circular economics with priority of hydrogen technologies CEETe**
- 8 REFRESH (project)
- 9 **H2 producing by biomass conversion 1300 kg/day (realization)**

Together, we develop new methods, materials and technologies for modern, low-carbon and sustainable energy in accordance with strategic documents at the national and international levels with the priority of hydrogen technologies.



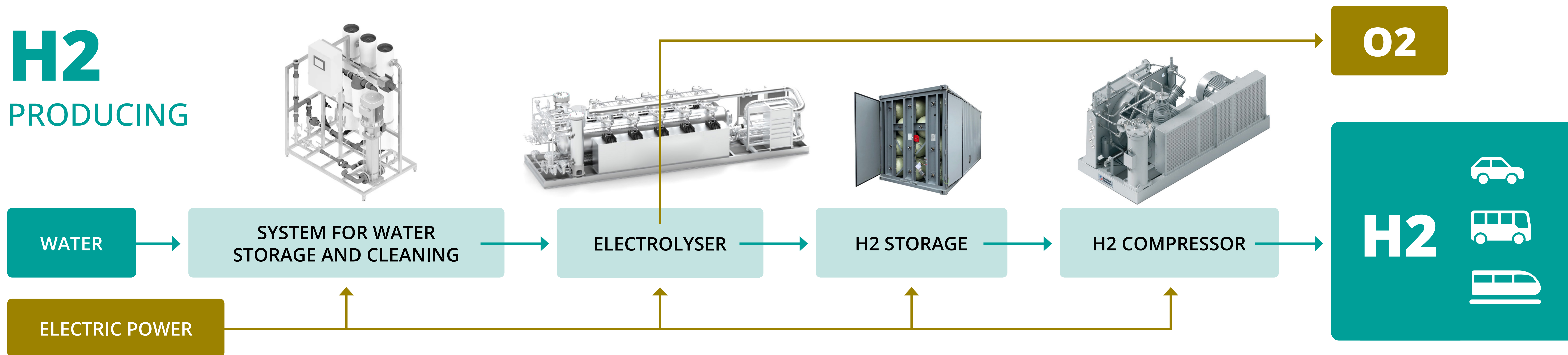


H2 PRODUCED FROM BIOMASS





H2 PRODUCING



ENERGY BALANCE

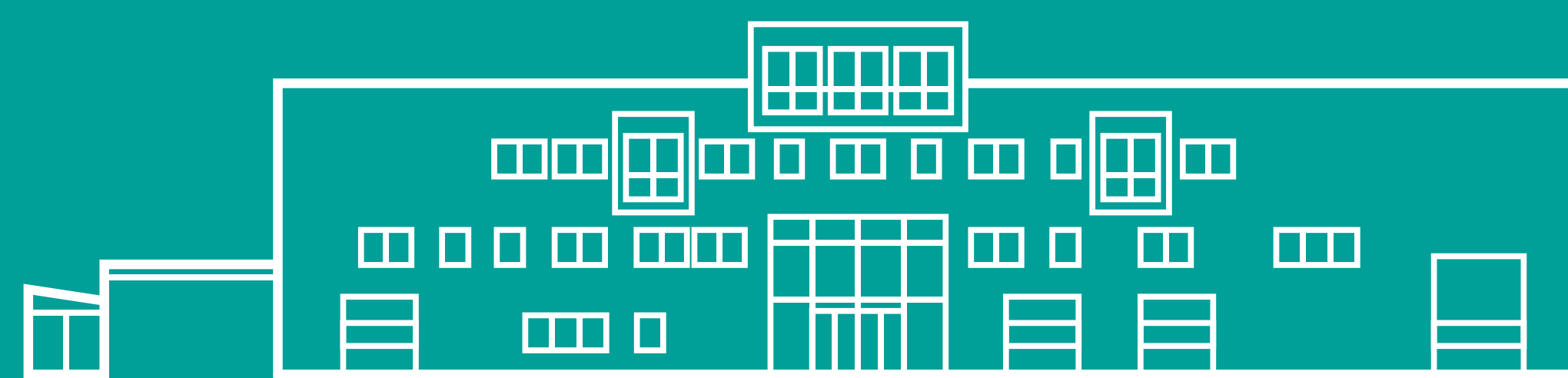
H2 producing Krnov, Olomouc **1,2 tons per day**

vehicle = consumption **1 kg H2 per day = 1200 vehicles**

bus = consumption **40 kg H2 per day = 40 buses**

train = consumption **90 kg H2 per day = 14 trains**

	H2O kg	ELECTRIC POWER MW	H2 MWhe, kg, Nm3, eq. petrol in l	O2 kg	WATER MWht
1 hour	483	3	2.1 MWhe, 54 kg, 600 Nm3, petrol equivalent 216l	429	1
24 hours	11 592	72	51.12 MWhe, 1 296 kg, 14 400 Nm3, petrol equivalent 5184l	10 296	21
1 year (8600h)	4 153 000	25 800	18 318 MWhe, 464 000 kg, 5 160 000 Nm3, petrol equivalent 1 857 600l	3 689	7 482



WALLe

Waste Allocation
Load Lifter Earth-Class

Centre for Energy
and Environmental
Technologies
- Explorer

CEETe

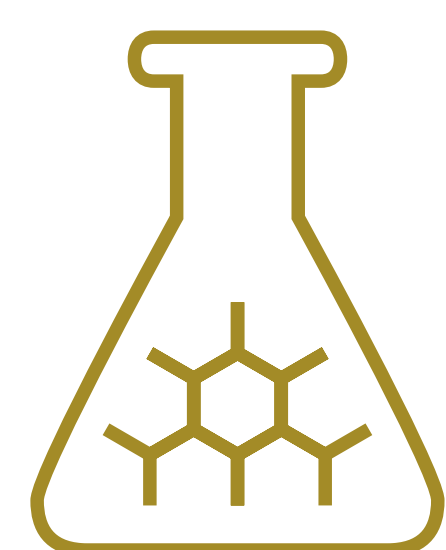


MOTIVATION: Centre of Energy and Environmental Technologies – explorer (CEET) is a multidisciplinary project focused on energy of the 21st century. Methods and technologies will be developed to ensure raw material self-sufficiency, environmentally friendly energy production, energy self-sufficiency and international safety.

A unique and novel research centre at European level is planned to be built in 2020-2023 to present modern methods for converting waste or other alternative fuels into useful forms of energy in a very gripping way.

The centre will use renewable energy sources and new ways of energy storing to present the direction of a modern, advanced society that is aware of their responsibility for the present and, above all, the future state of the environment.

The main features of this centre are an attractive design, combining functionalism for advanced technology presentation and “eco” design predetermining the centre’s utilization in urban areas, as well as modularity enabling diverse architectural distribution of individual laboratory blocks, and to this related mobility that makes the whole construction transportable to another location.





MODULAR

SCALABLE „LEGO SYSTEM“

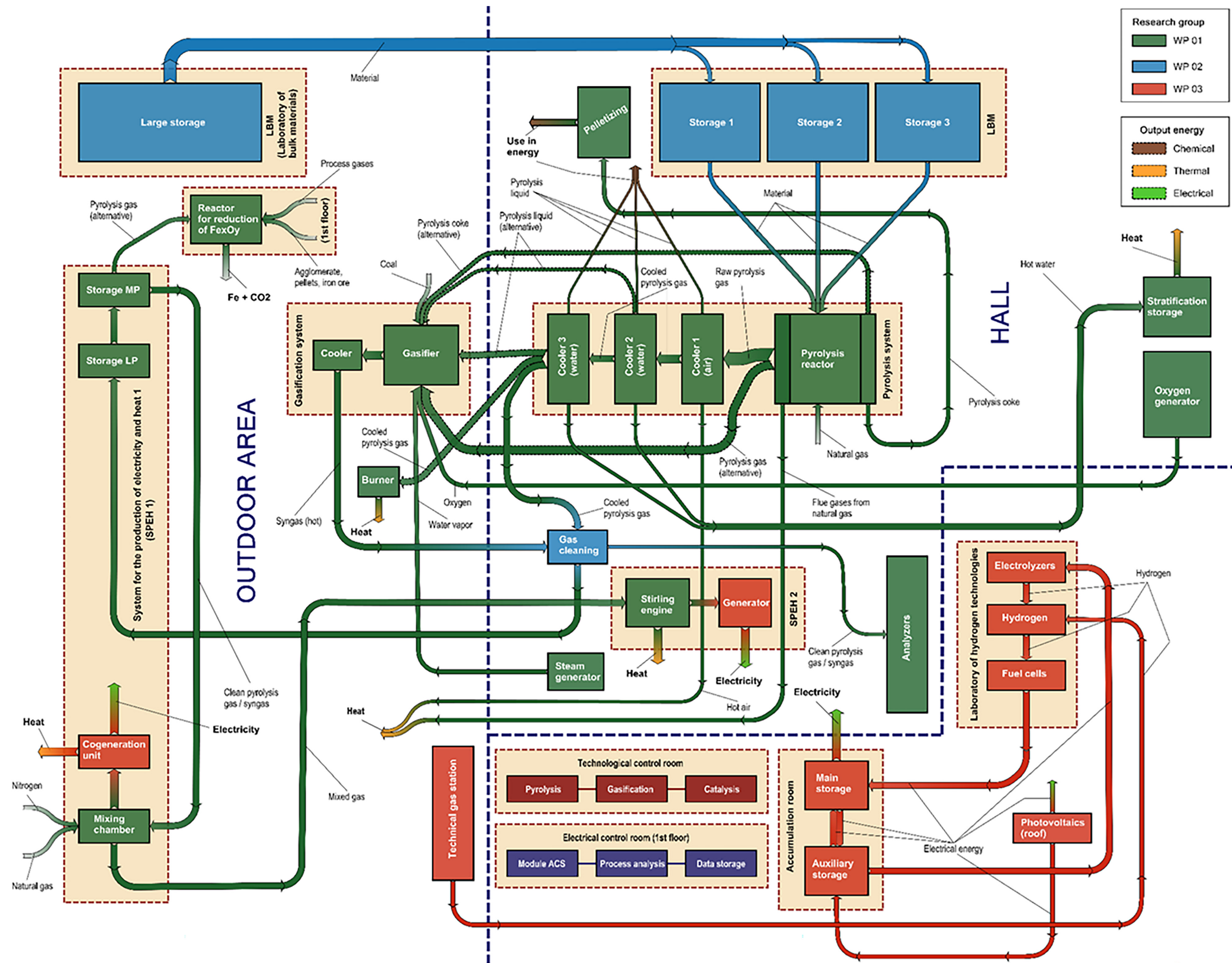
WITH NO PERMANENT GROUND ATTACHMENT – TEMPORARY BUILDING

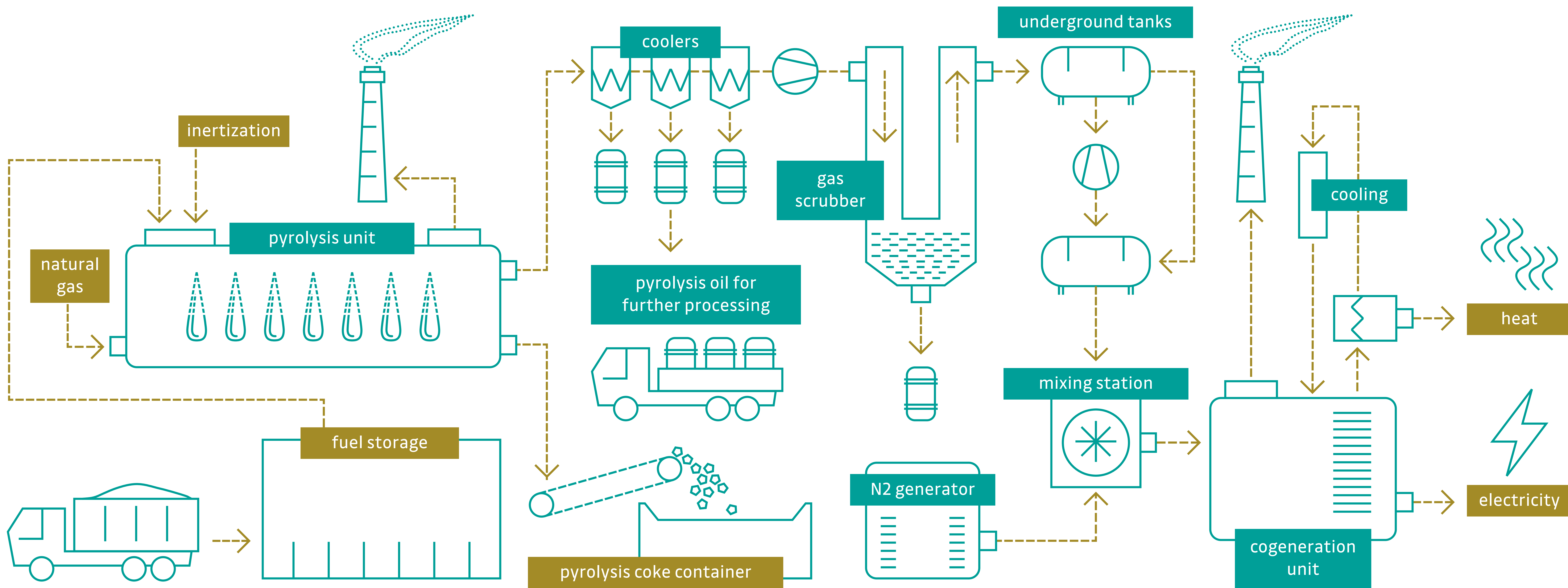
ENERGY LABEL A - ENERGY SELF-SUFFICIENT WITH ACTIVE ENERGY MANAGEMENT

EFFICIENT WATER MANAGEMENT

IN “ECO” DESIGN FOR INSTALLATION IN URBAN AREAS

DIGITAL TWIN, BUILDING INFORMATION MODELLING







THANK YOU
FOR YOUR
ATTENTION

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