LEADING RUSSIAN DEVELOPER AND MANUFACTURER OF FUEL CELL PRODUCTS AND RELATED SOLUTIONS

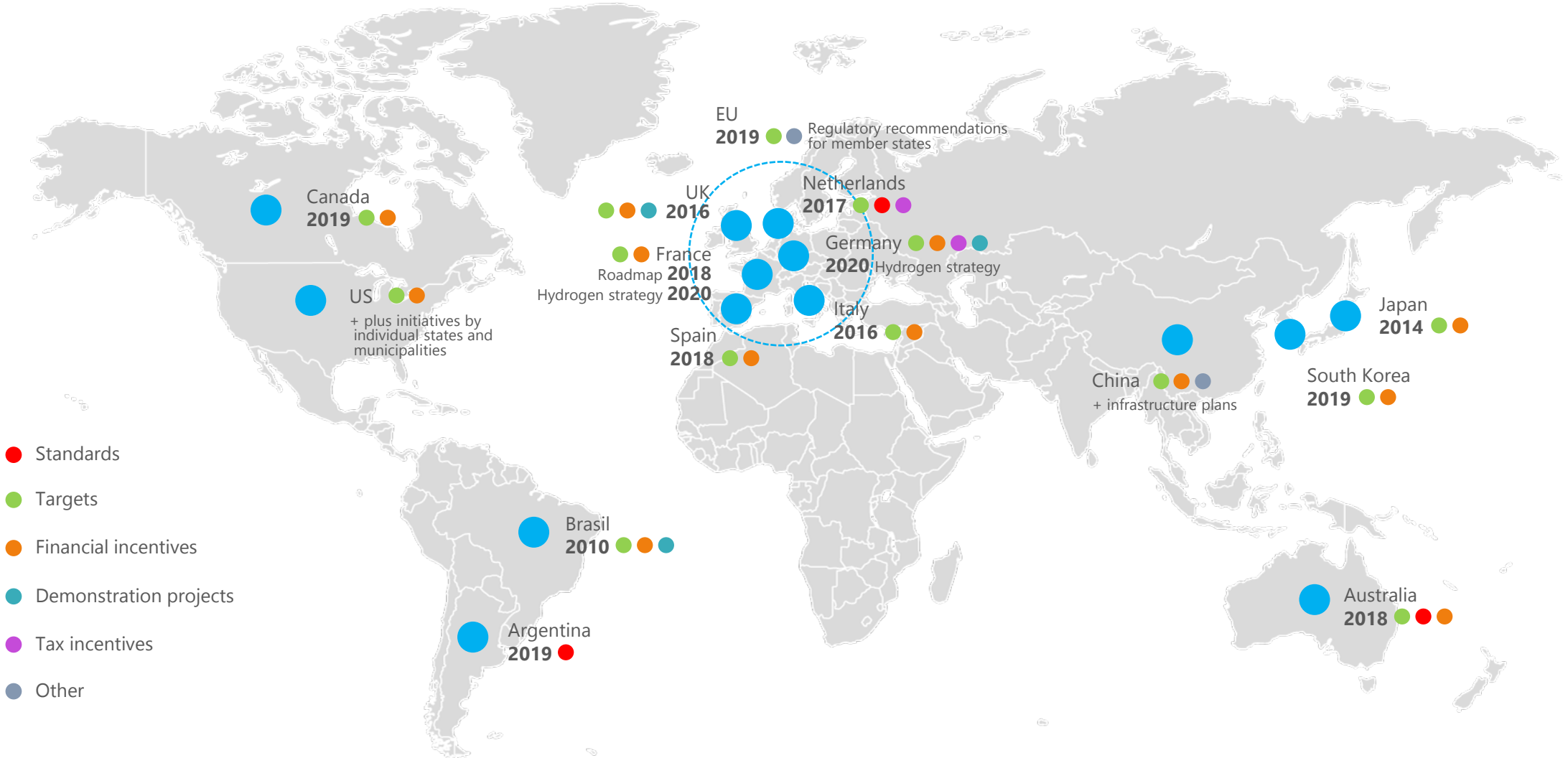
EU & RUSSIA CLIMATE CHANGE RESEARCH AND INNOVATION PRIORITIES

INENERGY GROUP

MOSCOW
2020

GOVERNMENT SUPPORT FOR HYDROGEN ENERGY(1)

NATIONAL HYDROGEN ROADMAPS AND STRATEGIES*



* According to IEA, except for the German national hydrogen strategy (here according to bwmi.de). The list doesn't pretend to be comprehensive since not all policy papers in the field have status of national strategies or roadmaps. Some policy papers of many individual regions, supra-regional entities and municipalities are not included as well. In certain cases regulatory initiatives covering hydrogen are part of more general sustainability/climate change action programs.

GOVERNMENT SUPPORT FOR HYDROGEN ENERGY (2)

CERTAIN BENCHMARK

EU roadmap provides, by 2050:

2.250 TW·h (24% of all energy needs) to be covered by hydrogen

820 Euro bn annual turnover of the hydrogen sector (H_2+equipment)

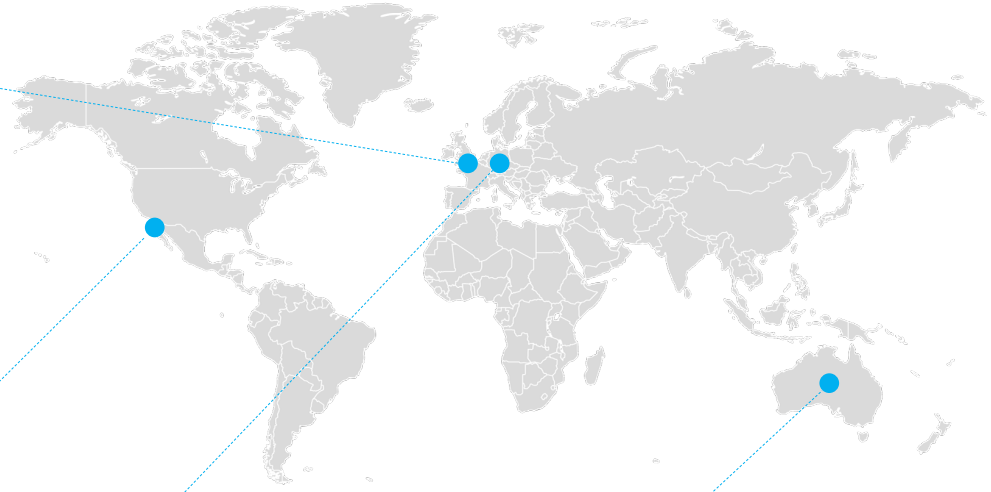
Creation of **5.4 mn** jobs

California Hydrogen Strategy envisages by 2030

1,000,000 vehicles (buses, trucks and cars)

1,000 hydrogen fueling stations

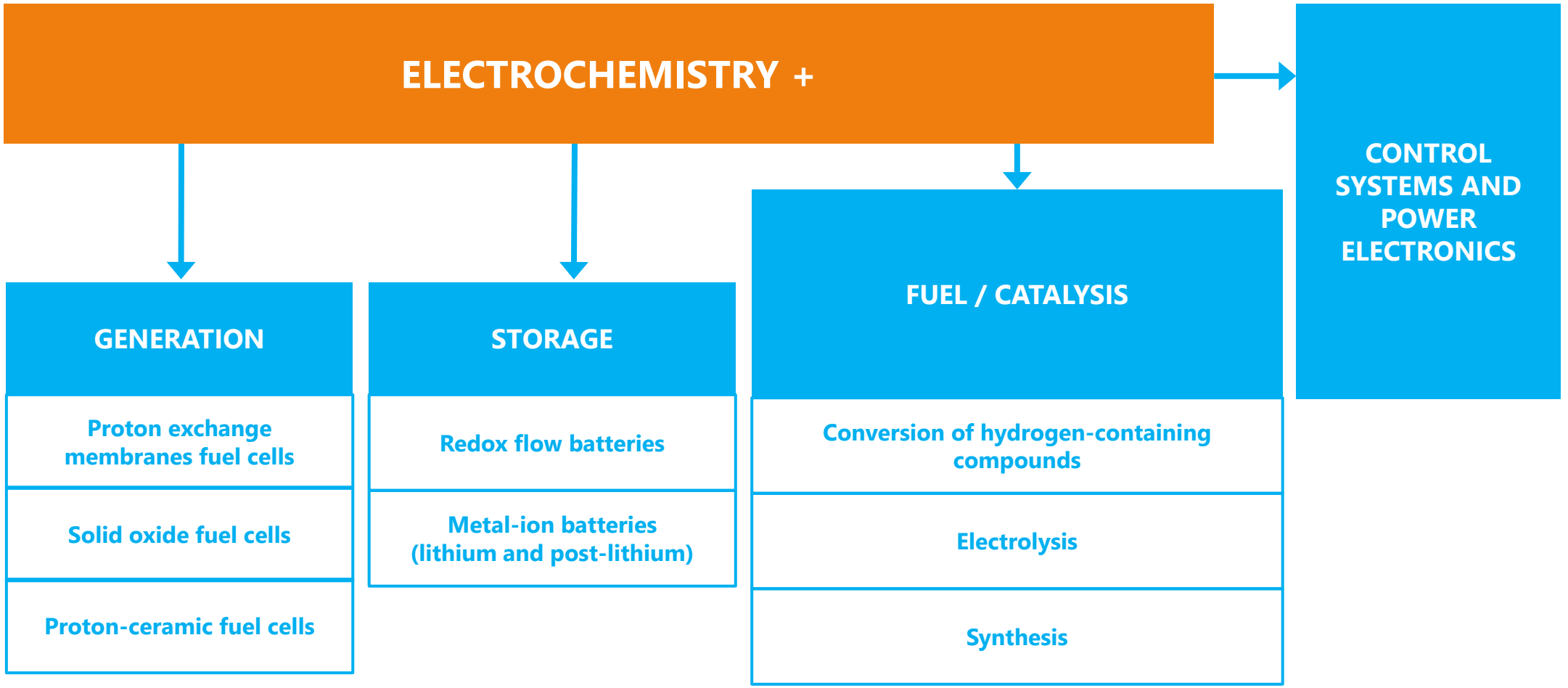
Germany plans to increase the capacity of electrolysers to **5 GW** by 2030 (200-fold increase against current level!).



Certain examples of hydrogen energy support policy (**Australia**)

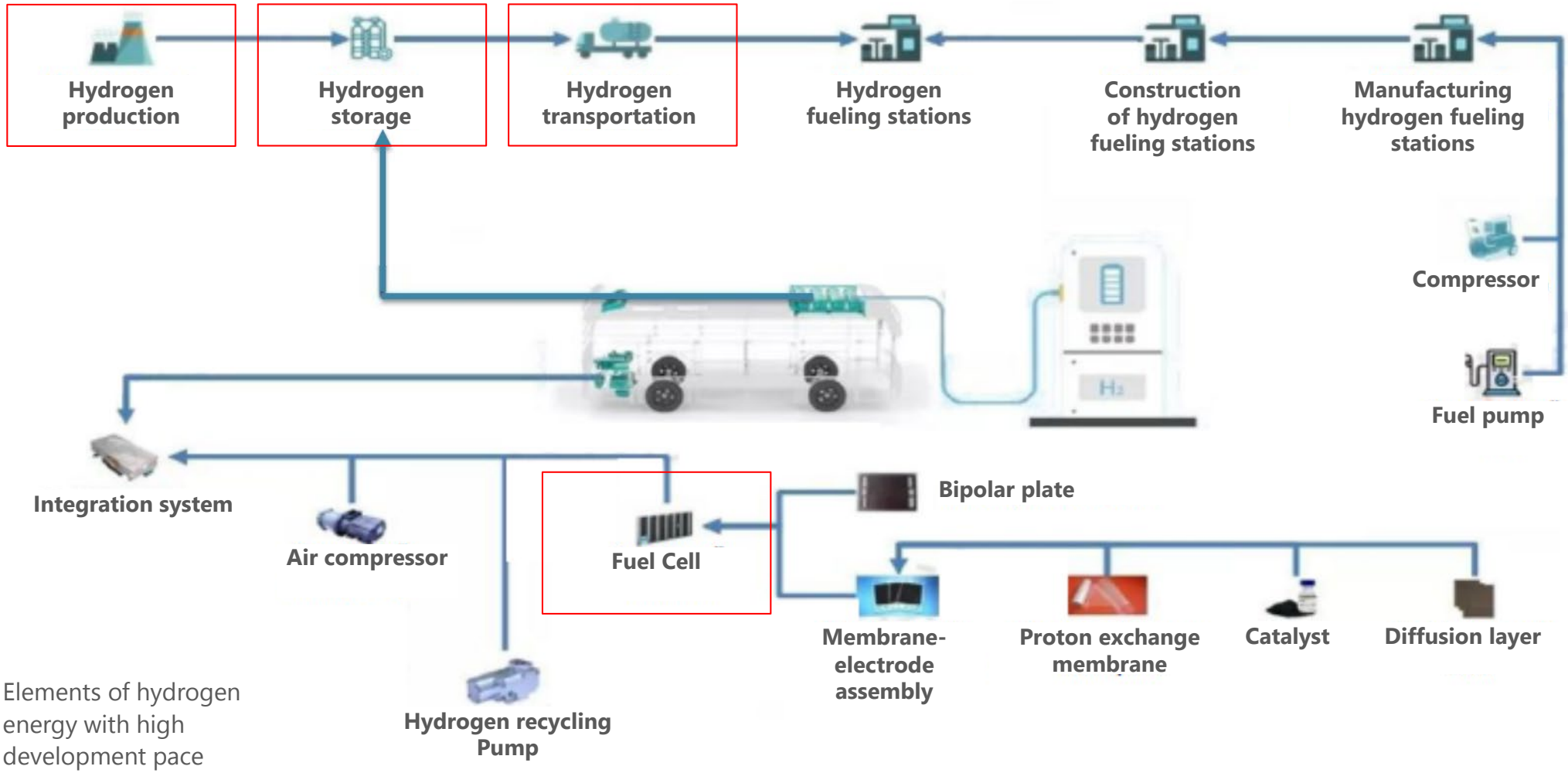
- Support of fuel cell vehicles
- Support of hydrogen use in remote mining projects and stand-alone communities
- Support of synthetic fuel for aviation and marine applications

NEW AND MOBILES ENERGY SOURCES PROGRAM (NAMES)



VALUE CHAIN OF HYDROGEN ENERGY

PRODUCTIONSTORAGE TRANSPORTATION and FUEL CELL … RAPIDLY DEVELOPING LINKS OF THE CHAIN



Elements of hydrogen energy with high development pace

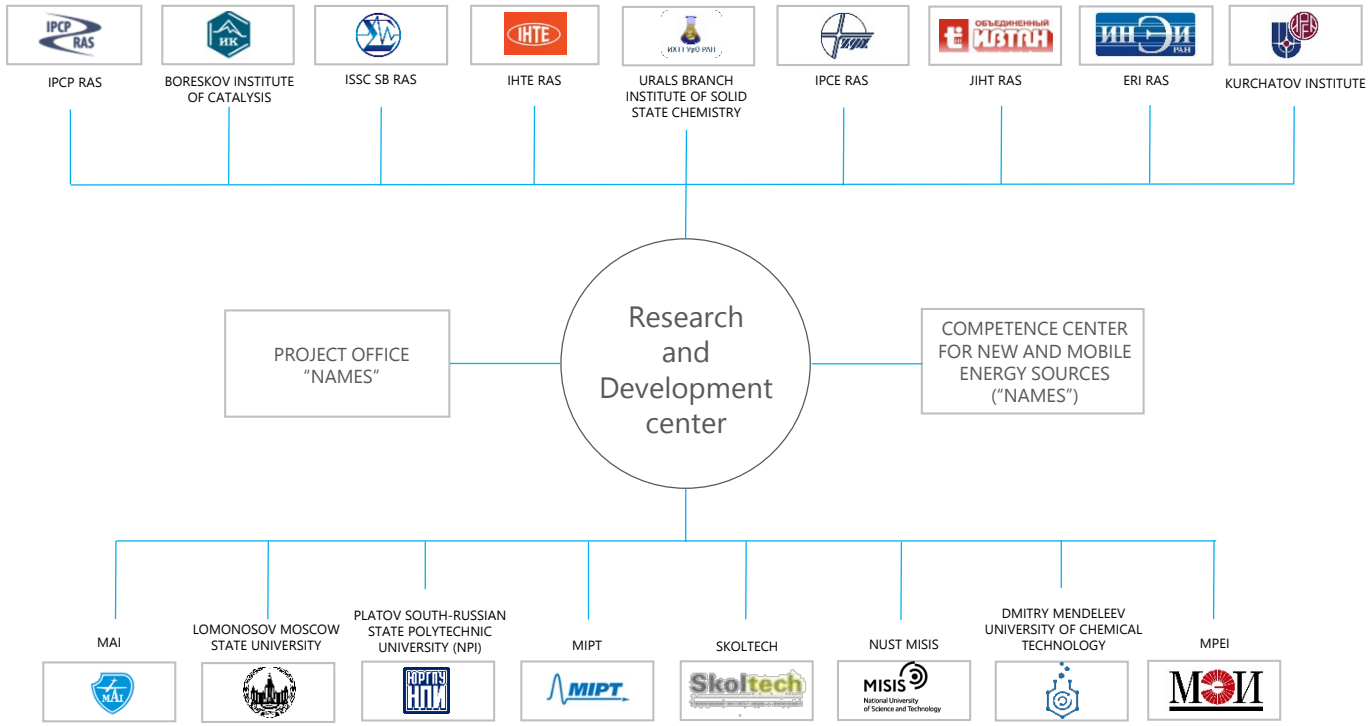
INENERGY GROUP

MAKING A DIFFERENCE WITH ELECTROCHEMICAL TECHNOLOGIES

Distributed R&D center with the leading research institutions of the Russian Federation allow us to solve fundamental and applied problems for the development of principally new products for the global market

JOINT PROJECTS

STRUCTURE OF R&D AND PROJECT LANDSCAPE*



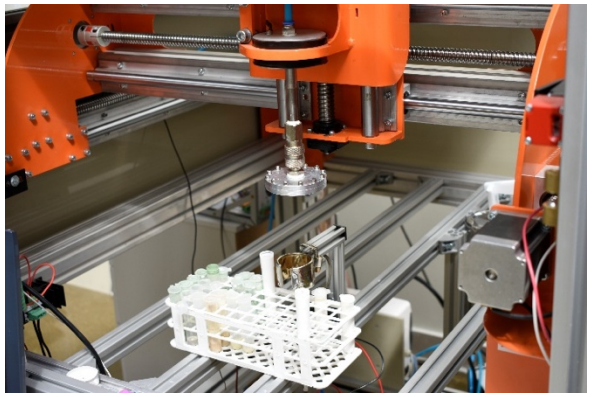
* For more information, please visit the website: www.inenergy.eu

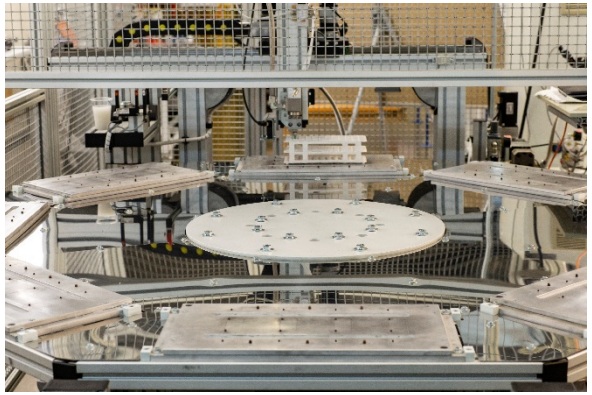
TECH SME AS BRIDGE OF INTERNATIONAL COOPERATION FOR SUSTAINABLE ENERGY EXPERIENCE OF INENERGY

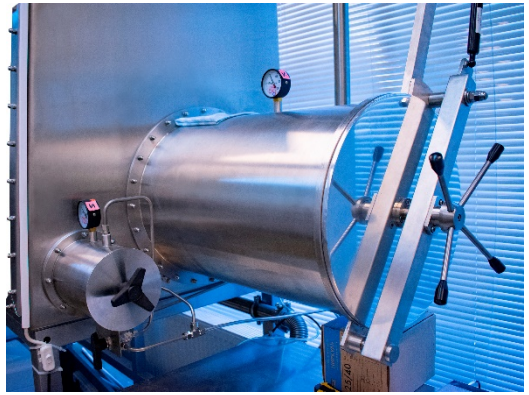
- Participation in joint Finnish/Russian project for upcycling industrial air pollutants ($CO/CO_2/CH_4$) and industrial and household waste (plastics and lignin). The goal is to develop technology converting the wastes and the pollutants into high added value materials, such as carbon nanotubes and graphene.

- Industrial partner in BRICS multilateral R&D program for development of a new metal-hydride hydrogen storage systems. Such systems, in combination with fuel cells, will have high effect in systems with weather – dependent renewable energy sources as well as for compact carbon-free power sources in transportation, internet-of-things and portable devices.

- Cooperation with The University of Western Cape (South Africa) in development of hydrogen proton-exchange membrane fuel cells and stacks for UAVs.







CONCLUSION

- Russia is “waking up” to climate agenda
- Tech SMEs are flexible and entrepreneurial by their nature
- Tech SME play important role in bridging science and industry, large and small companies, East and West
- The “bridging role” of tech SMEs should be supported and fostered
- The goal of this support should be establishment of cross-border “clusters of excellence”

THANK YOU FOR YOUR ATTENTION