



New and Emerging Energy Technologies

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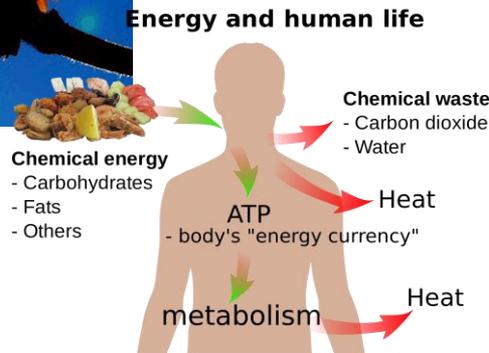
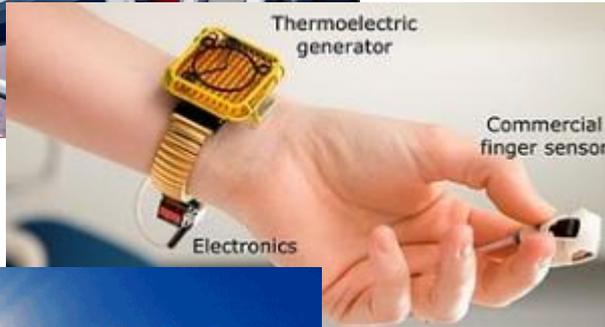
E-Power Mo!
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Importance of Emerging Technology in the Philippine Energy Sector



HUMAN KINETIC ENERGY



There are four (4) main energy sources that are present in our environment:

- Mechanical Energy
- Thermal Energy
- Radiant Energy
- Chemical Energy

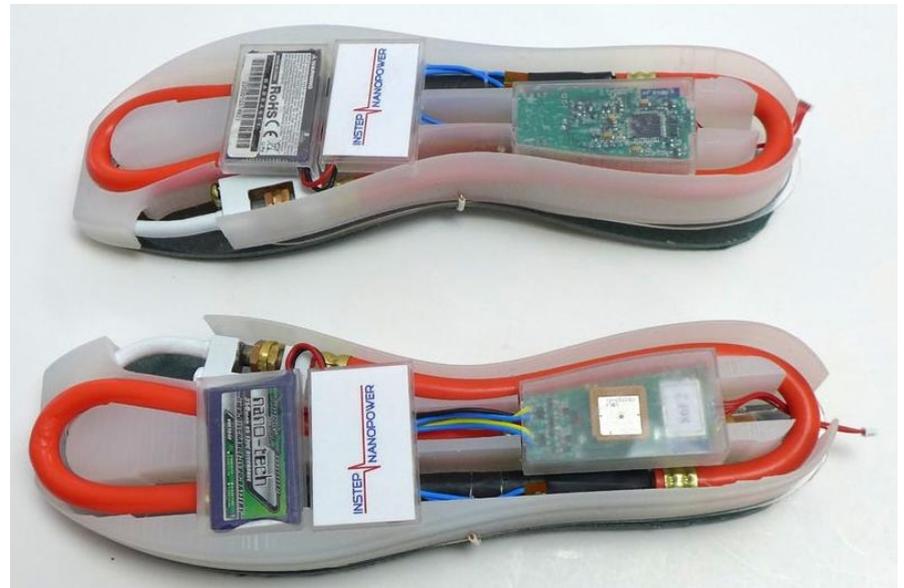




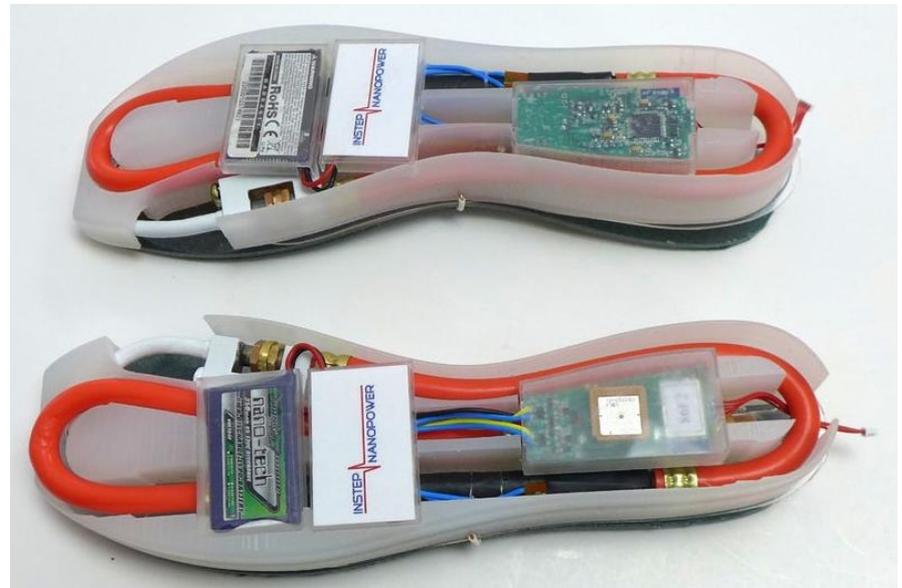
- Gym machines at Congresbury, Bristol in England feeds around 100 Watt each unit per hour which supports gym building's power supply.
- It uses 30% less electricity than regular machines.
- Can be controlled by a smartphone.



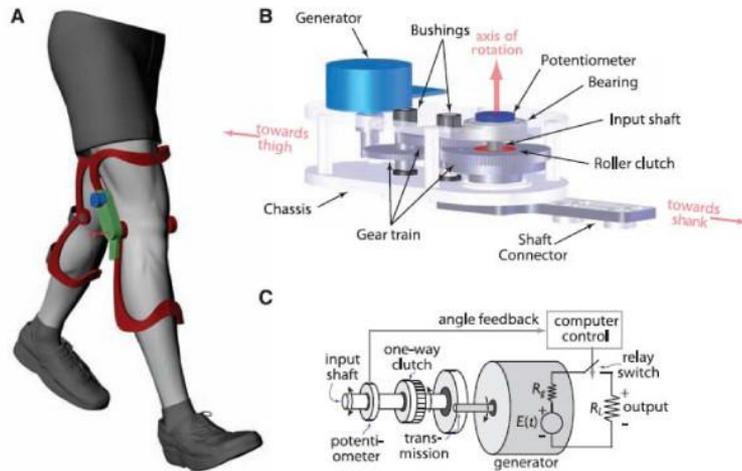
University of Wisconsin - Madison – College of Engineering created an energy-harvesting shoes that could be used to power mobile devices through a charging cable. This will be adapted for the military or act as a power source for people in remote areas



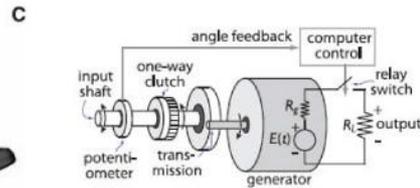
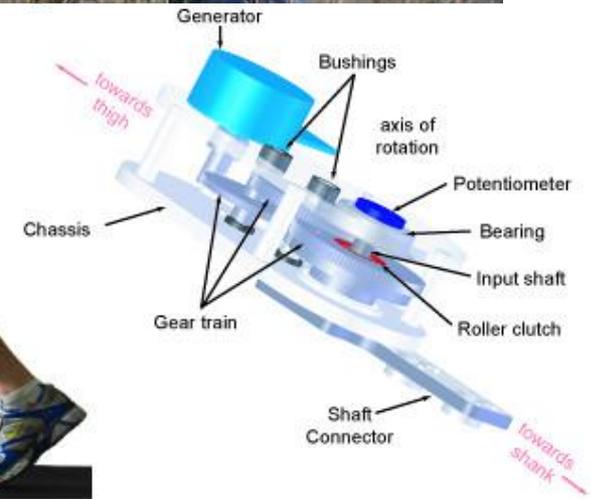
Study show that it can produce up to 10 watts per shoe, and that energy is just wasted as heat. A total of 20 watts from walking is not a small thing, especially compared to the power requirements of the majority of modern mobile devices.

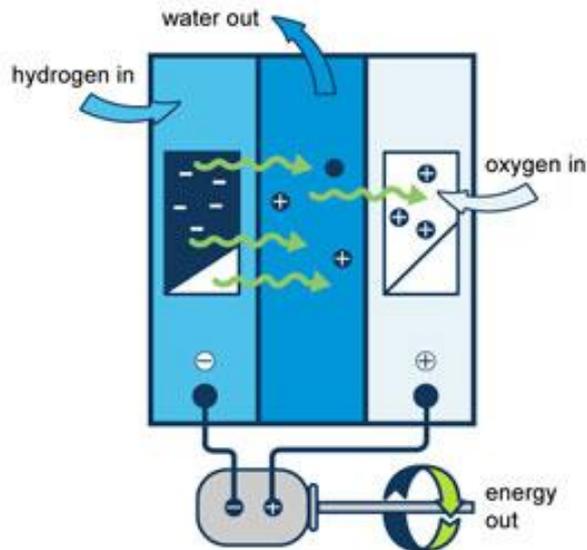
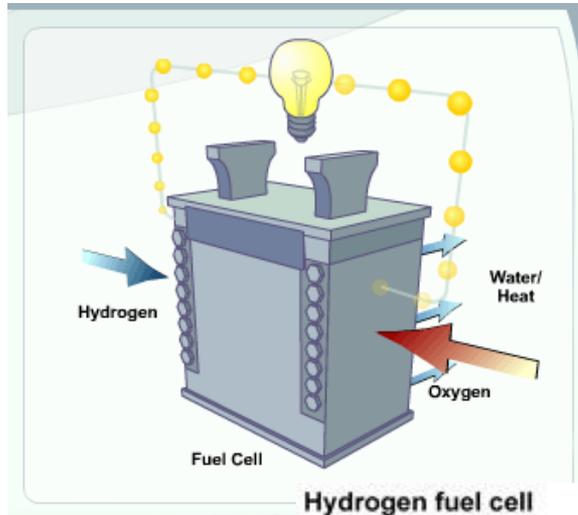


Biomechanical energy harvesting is capable of generating substantial amounts of electrical power from walking with little additional user effort making future versions of this technology particularly promising for charging portable medical devices.

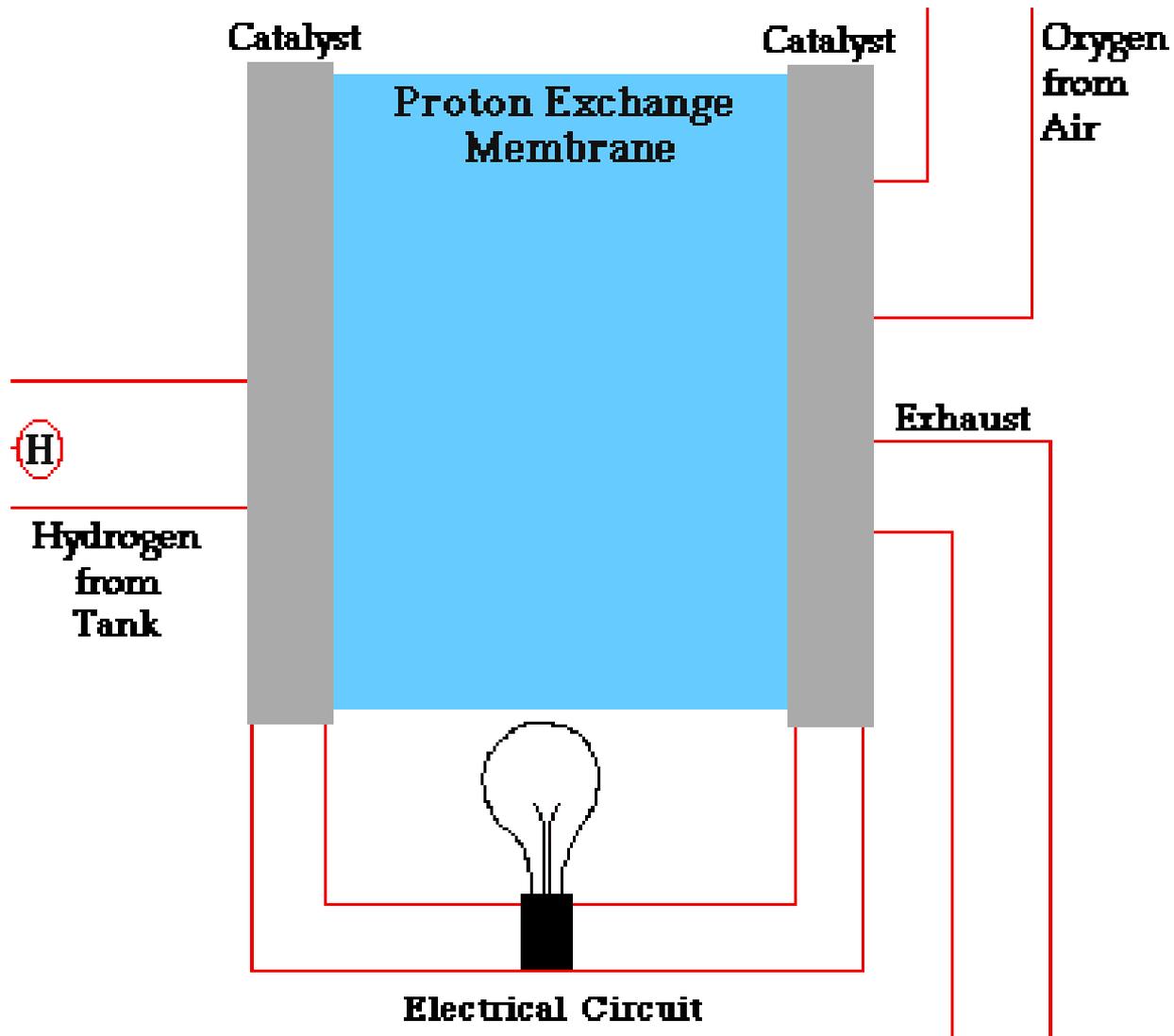


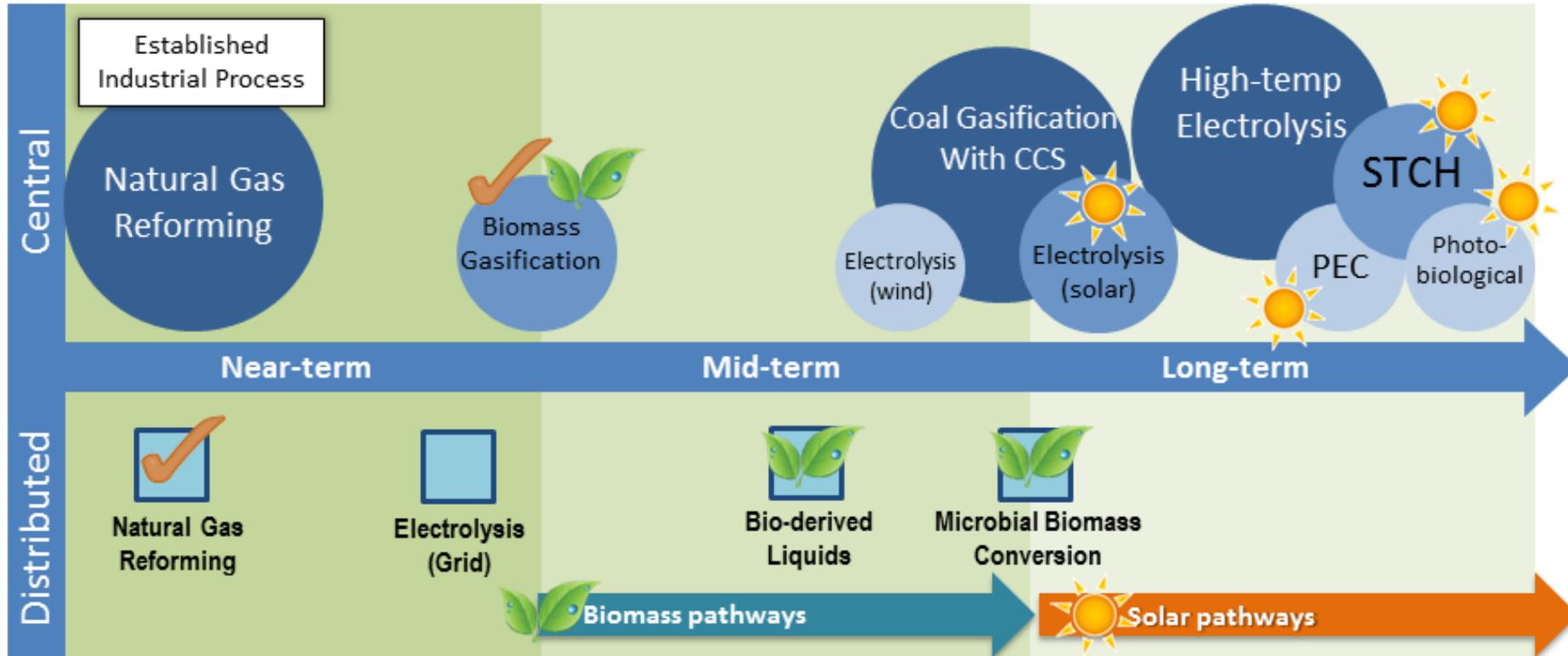
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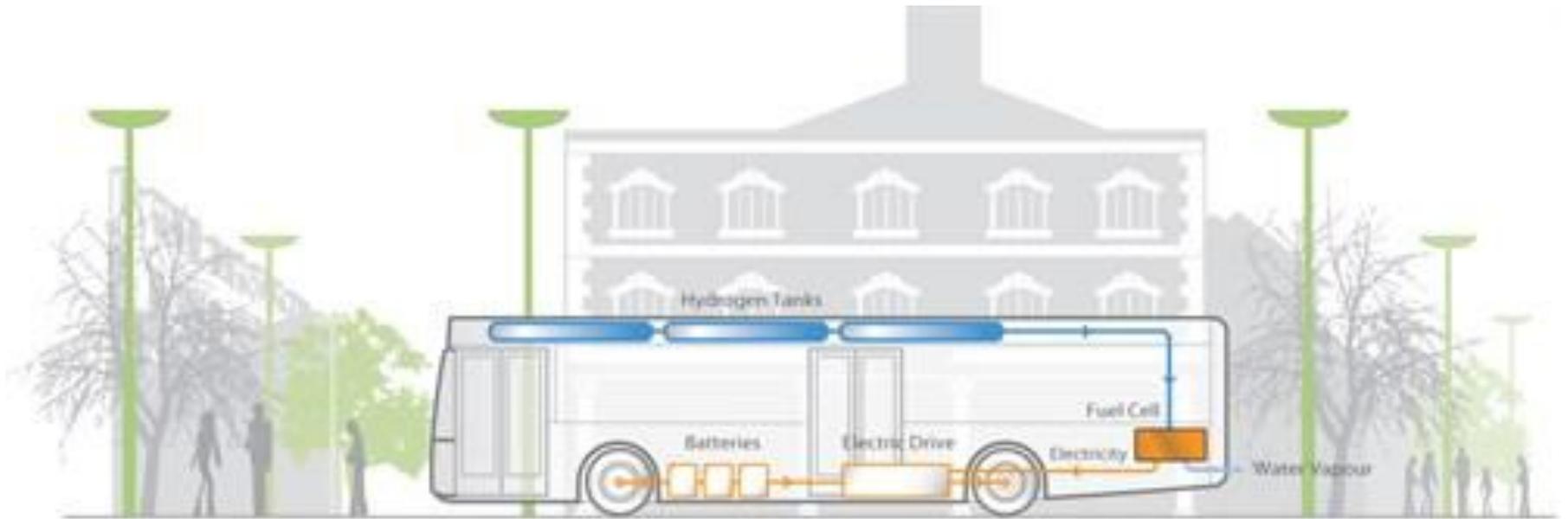


A fuel cell is a device that uses hydrogen (or hydrogen-rich fuel) and oxygen to create electricity. Fuel cells are more energy-efficient than combustion engines and the hydrogen used to power them can come from a variety of sources.

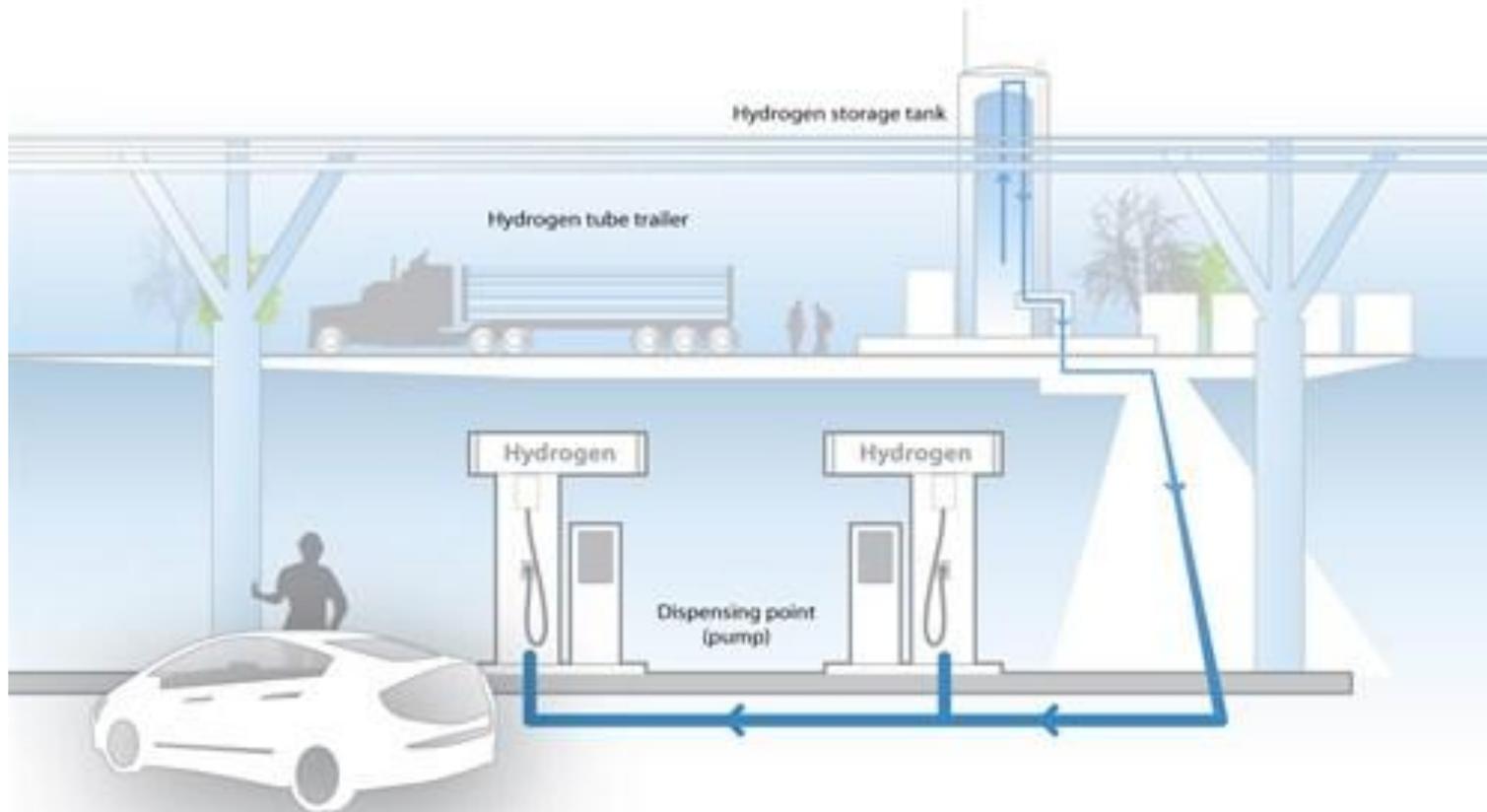




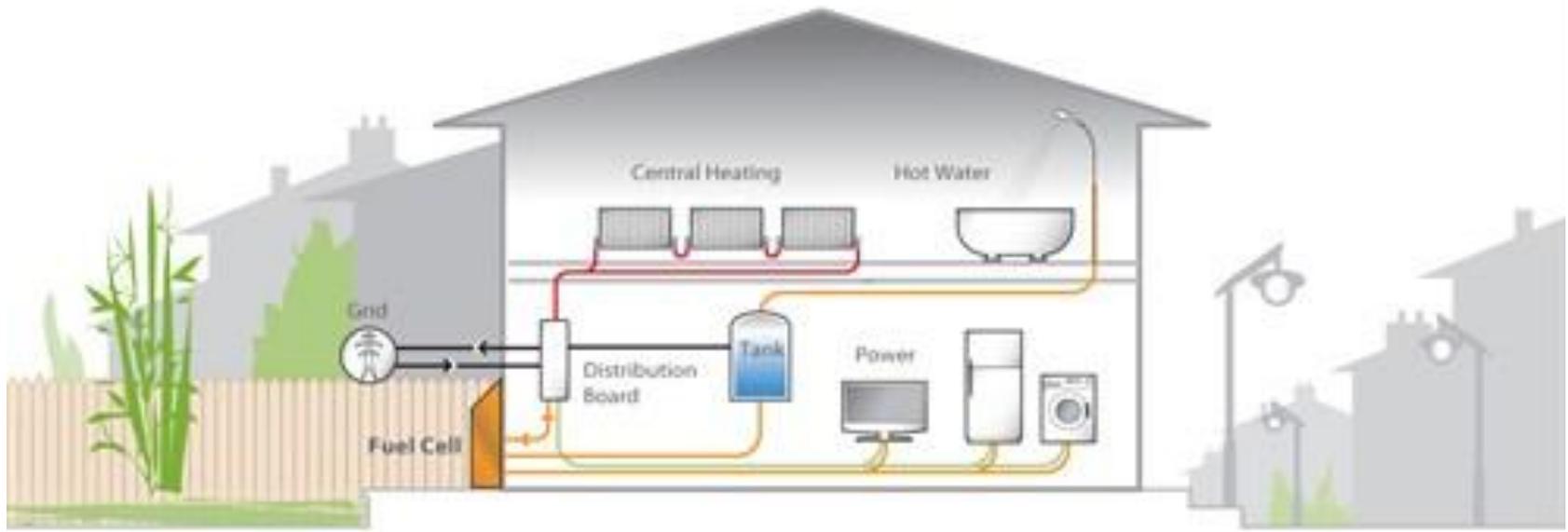
Transportation



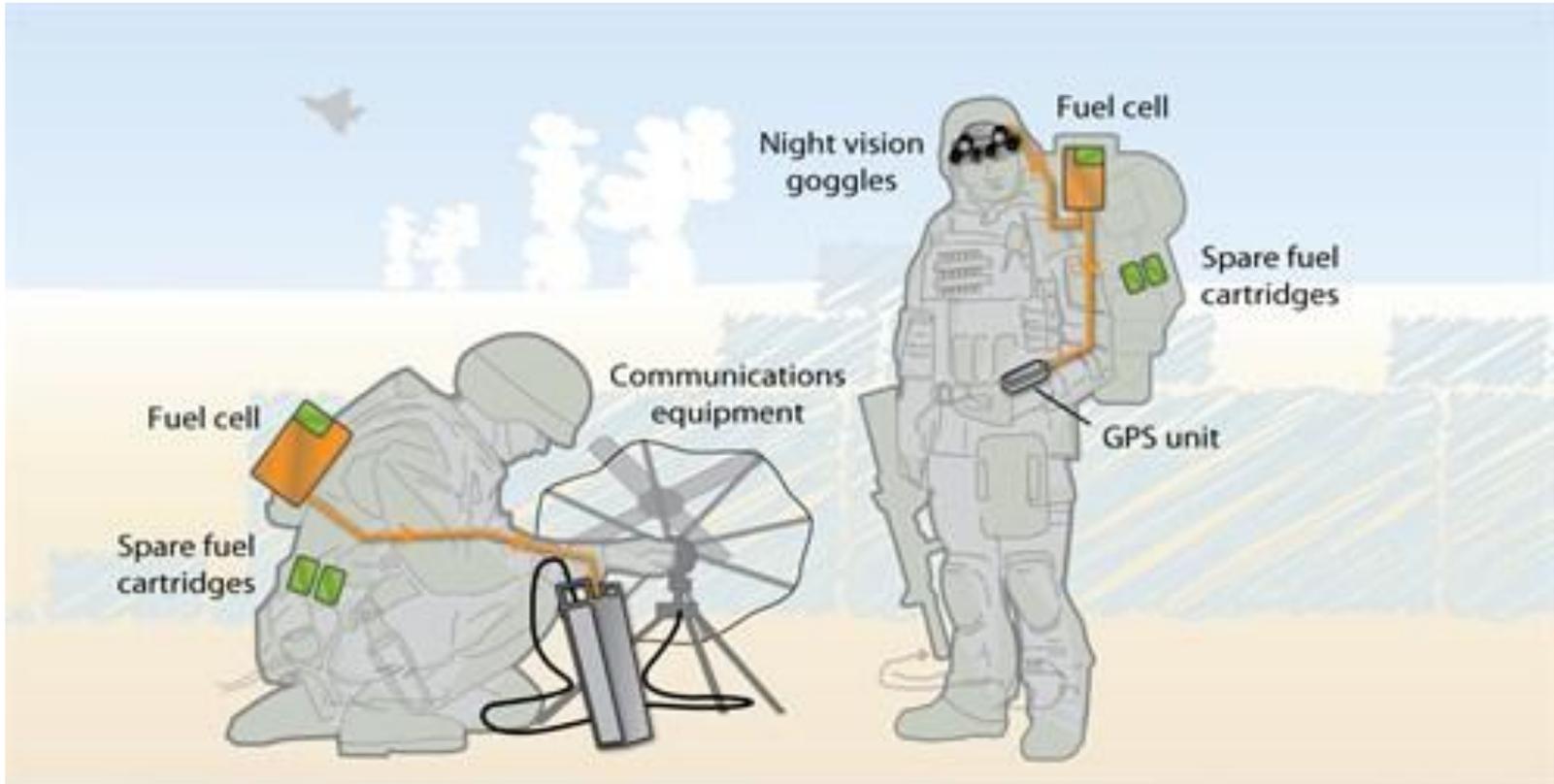
Fuel and Infrastructure



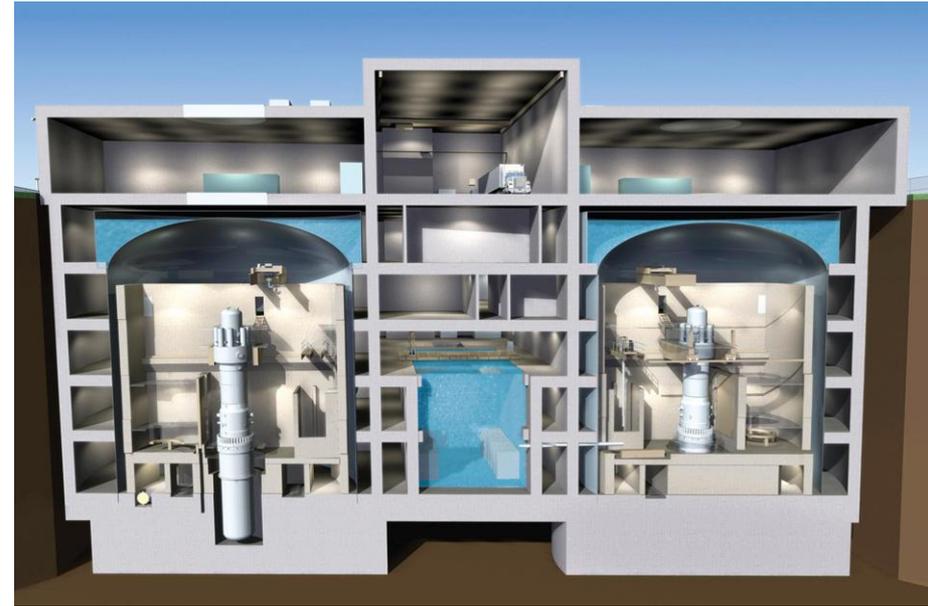
Stationary



Portable



Small modular reactors (SMRs) are a type of nuclear fission reactor which are smaller than conventional reactors. These are manufactured at a plant and brought to a site to be fully constructed. Modular reactors allows lesser on-site construction, it also increased containment efficiency, and it heightens nuclear materials security.



	Advantages	Challenges
Technological Issues	<ul style="list-style-type: none"> • Shorter construction period (modularization) • Potential for enhanced safety and reliability • Design simplicity • Suitability for non-electric application (desalination, etc.). • Replacement for aging fossil plants, reducing GHG emissions 	<ul style="list-style-type: none"> • Licensability • Non-LWR technologies for embarking countries • Operability performance/record • Technology maturity/proveness • Human factor engineering; operator staffing for multiple-modules plant • Post Fukushima action items on design and safety
Non-Technological Issues	<ul style="list-style-type: none"> • Fitness for smaller electricity grids • Options to match demand growth by incremental capacity increase • Site flexibility • Reduced emergency planning zone • Lower upfront capital cost (better affordability) • Easier financing scheme 	<ul style="list-style-type: none"> • Economic competitiveness • First of a kind cost estimate • Legal and Regulatory infrastructure • Availability of design for newcomers • Infrastructure requirements • Emergency planning zone • Security personnel requirements • Post Fukushima action items on public acceptance



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Thank You!



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