



# Hy4Heat

demonstrating  
hydrogen for heat

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Futurebuild 2020

ARUP



# Hydrogen for Heat - Hy4Heat

- Innovation Programme
- Funded by Government Department of BEIS
- Use of ~100% hydrogen in existing buildings and homes (<7bar, downstream of the ECV – emergency control value)



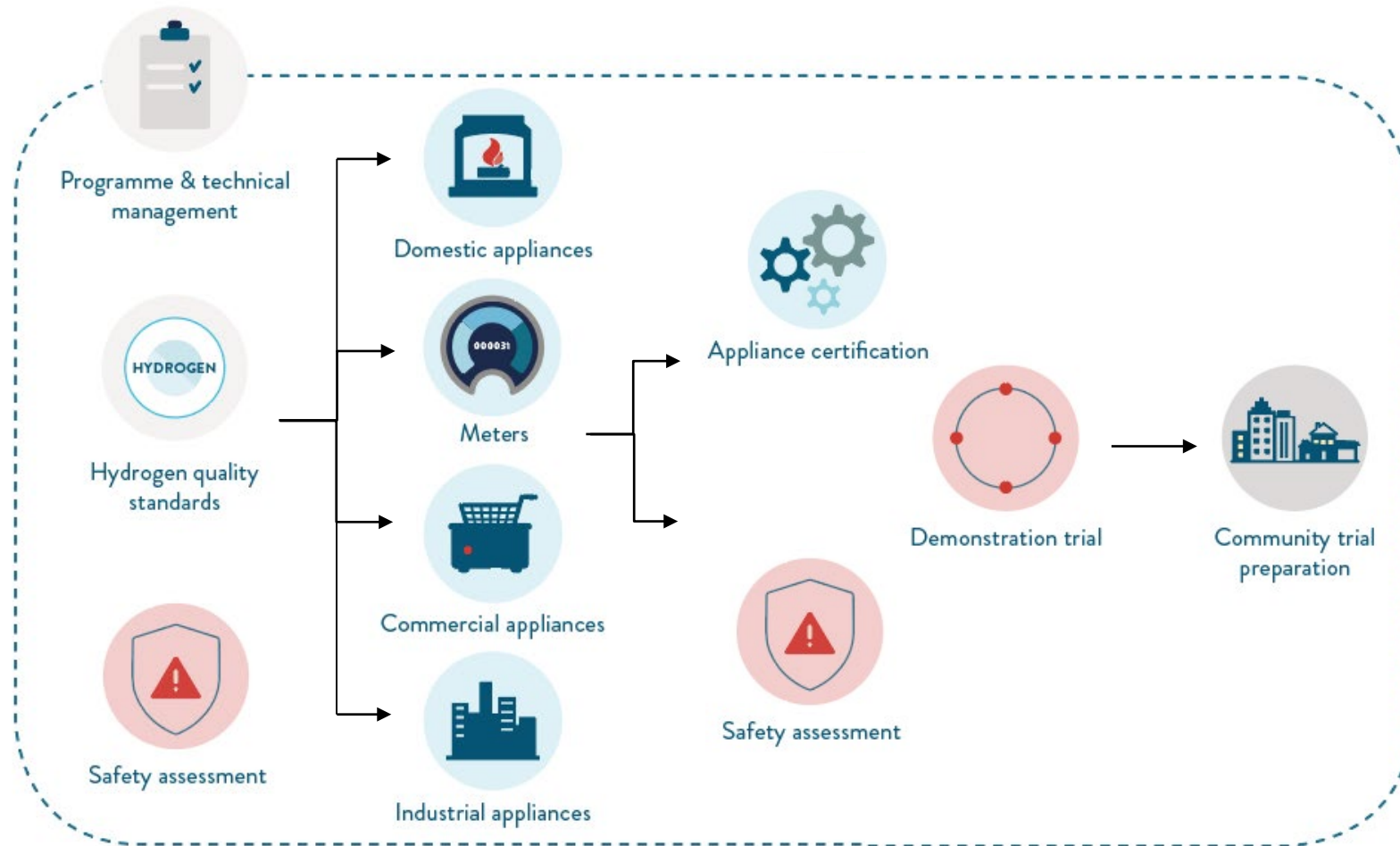
# Hy4Heat's mission

To establish if it is technically possible, safe and convenient to replace natural gas (methane) with hydrogen in residential and commercial buildings and gas appliances.

This will help enable the government to determine whether to proceed to a community trial of hydrogen.



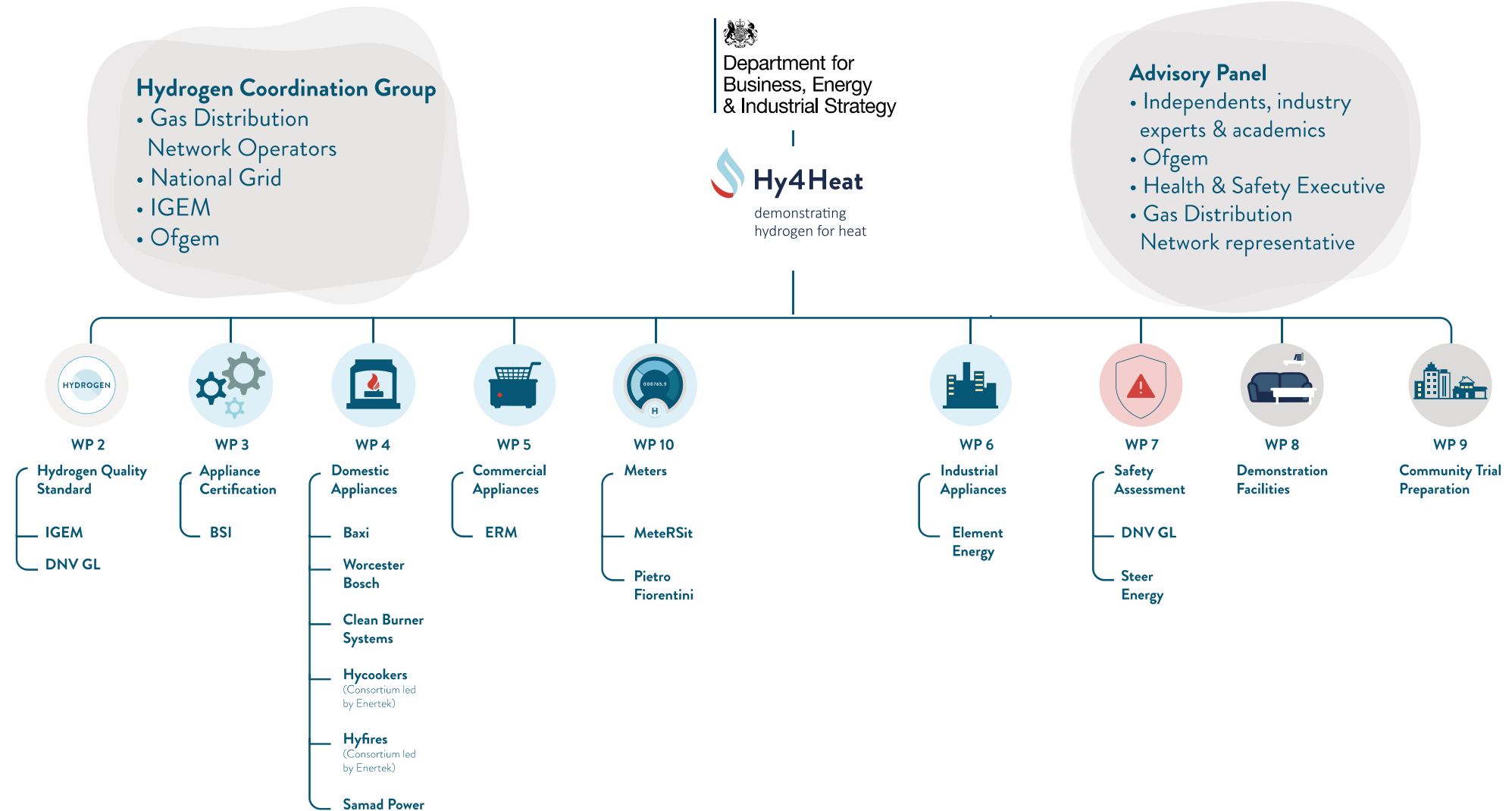
# Hy4Heat programme work packages



# ARUP+

KIWA | EMBERS | YOENERGY  
PROGRESSIVE ENERGY

# Governance structure

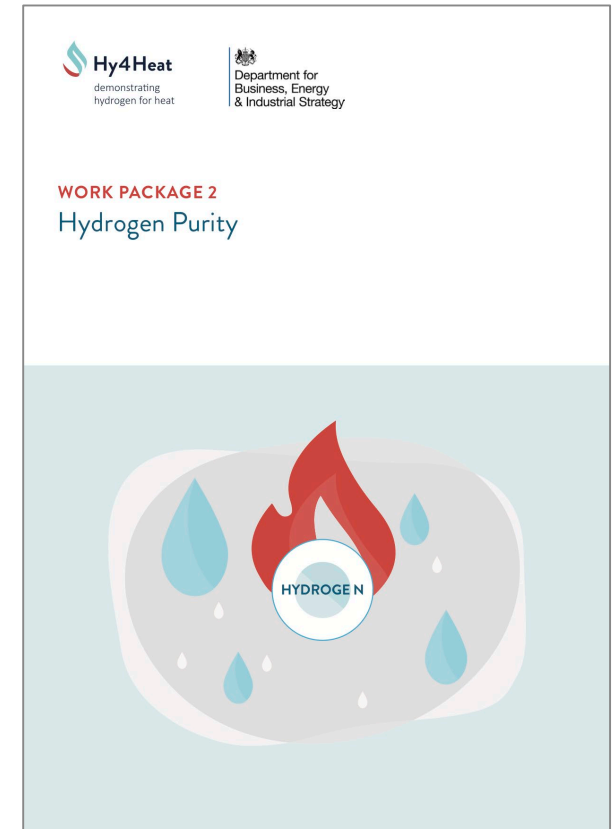


# Hydrogen quality and standards (WP2)

- IGEM is developing a hydrogen **Reference Standard** and **Enabling Standard**
- Hydrogen **purity** report - published
- Hydrogen **colourant** report – due to be published
- Hydrogen **odorant** report – due to be published



elementenergy



# Certification of hydrogen appliances (WP3)

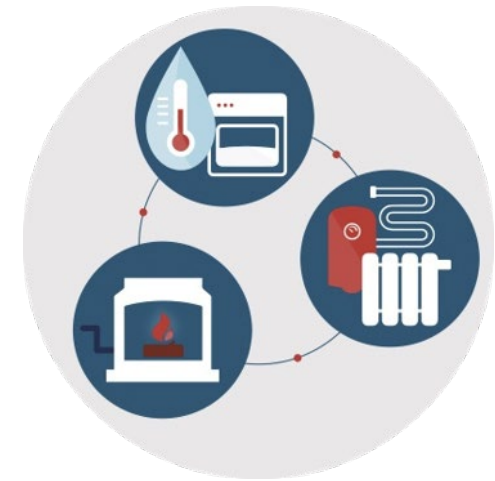
- Appliances certified under GAR (Gas Appliance Regulation)
- **British Standards Institute** has developed **PAS4444** – *‘Guidance on the development and testing of hydrogen appliances’*
- Public consultation on PAS4444 ended 10 Jan 2020 – will be published in Spring 2020



**bsi.**

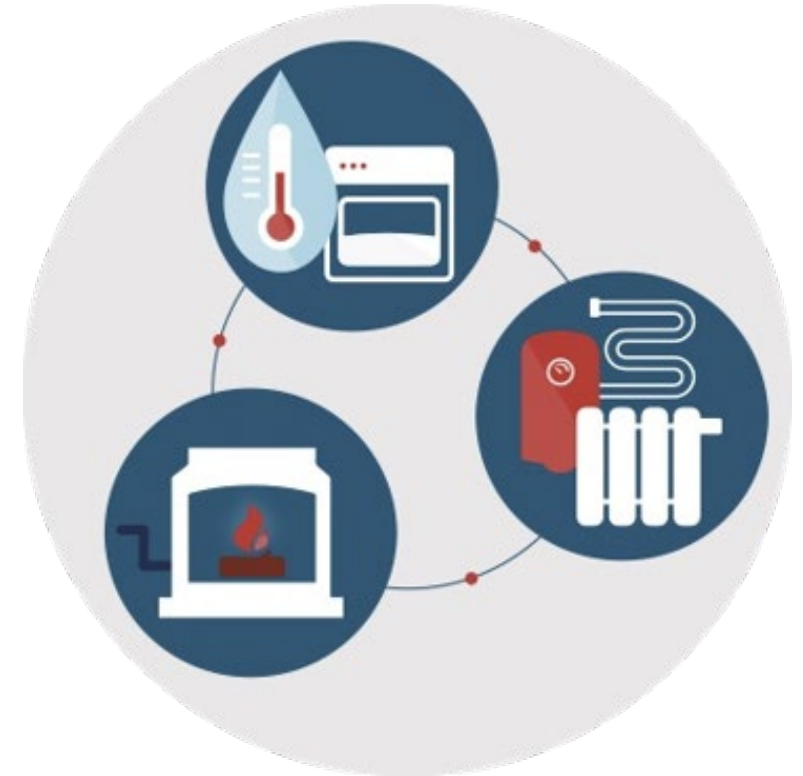
# Development of domestic hydrogen appliances (WP4)

- Developing appliances that are **'like for like'** existing home gas appliances
- Developing **'hydrogen-ready'** appliances – supporting a more convenient transition
- Must meet, or improve upon existing emission, safety, and functional requirements
- Appliances being developed include:
  - boilers
  - cookers
  - gas fires
  - innovative hydrogen appliances

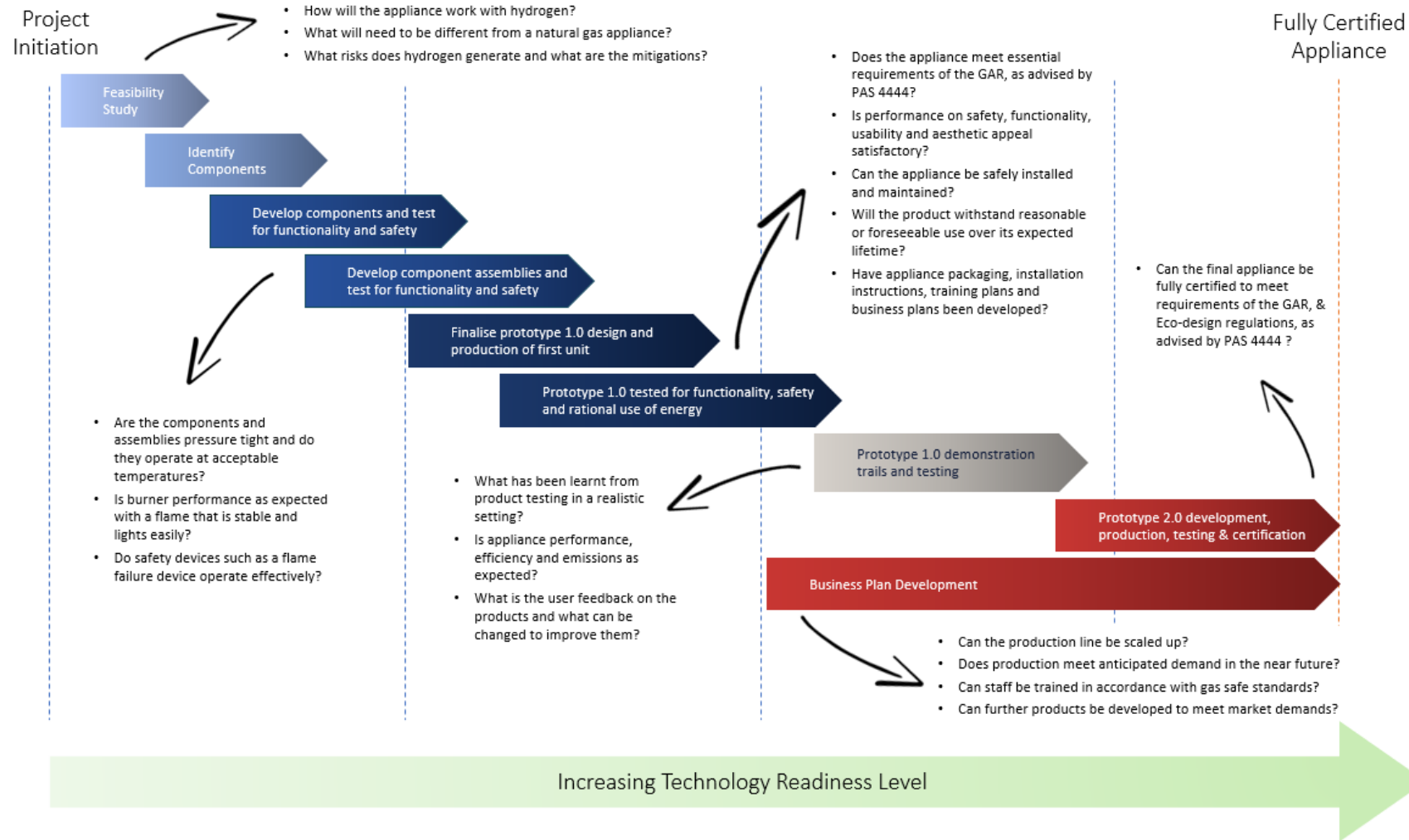




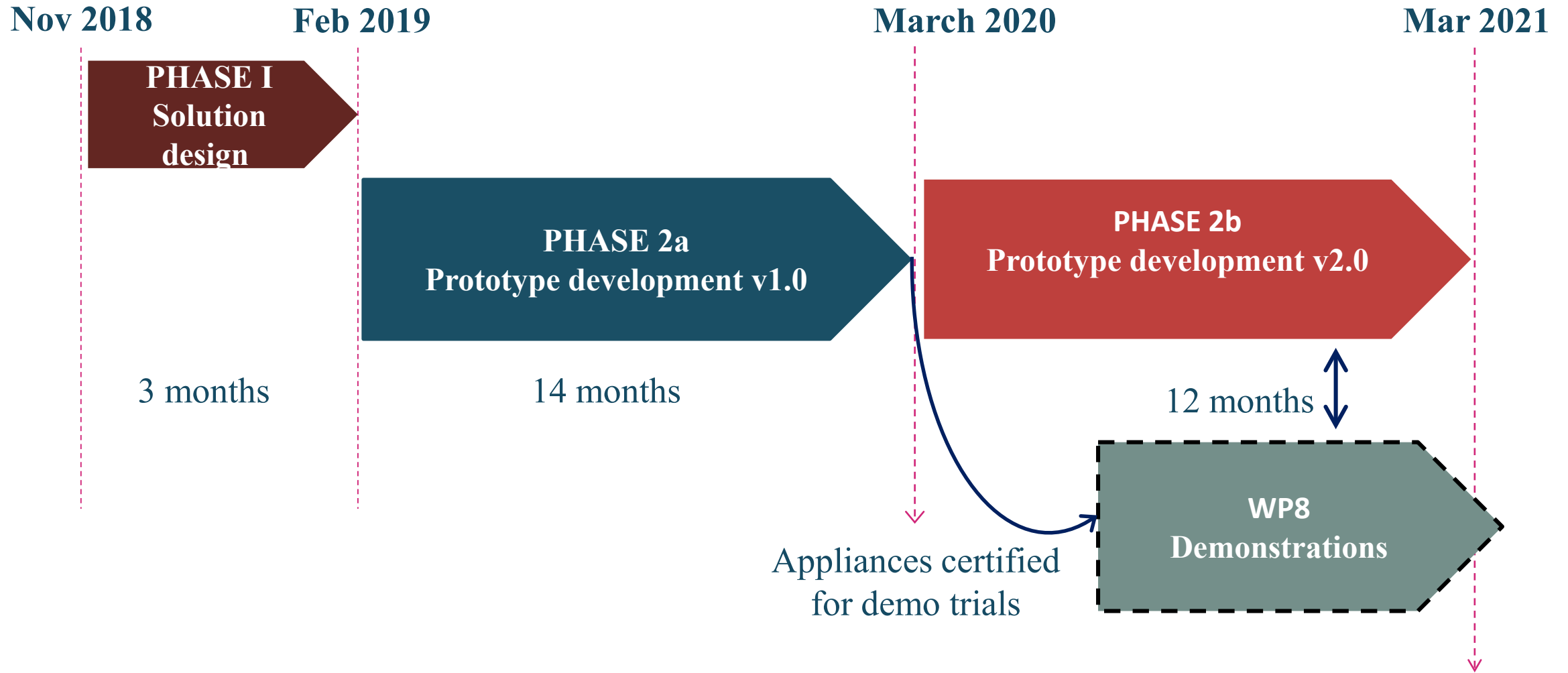
# Organisations developing domestic hydrogen appliances (WP4)



# Appliance development pathway (WP4)

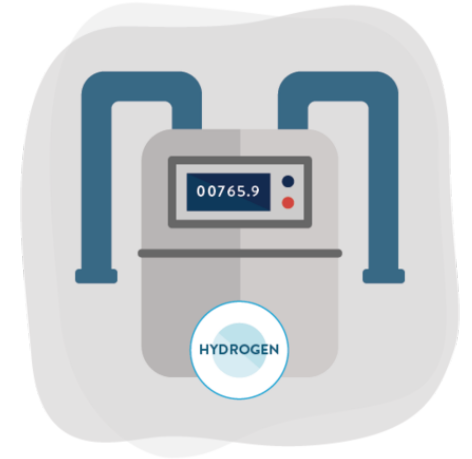


# Appliance development and demonstrations timeline



# Developing hydrogen meters (WP10)

- Fiscal and smart enabled meters (SMETS2)
- Meter will include an 'excess flow valve' and 'gas disablement functionality'



## Developing commercial appliances (WP5)

- Market study into commercial sectors – due to be published
- Commercial hydrogen appliances being developed:
  - Catering & production heating
  - Dry space heating
  - Wet space heating
  - Combined heat and power



# Industrial heating equipment (WP6)

- Market study into industrial sector – report published
- A number of other BEIS innovation programmes developing this area further



# Safety assessment (WP7)

- Comparing risks of hydrogen and natural gas
- Building on knowledge, data, and evidence that already exists
- Undertaking experimental testing in a range of scenarios, covering:
  - Leakage
  - Accumulation
  - Dispersion
  - Ignition
- Analysis, QRA and consequence assessment
- Collaborating with GDNO's to gather more detailed incident data
- Engagement with the HSE



# Demonstrations (WP8)

- Showcasing the prototype hydrogen appliances
- Setting in a kitchen, living room, bathroom etc, including cooking demos
- Spring 2020 onwards





## Preparations for a community trial (WP9)

- Evidence to demonstrate the technologies are feasible (i.e. hydrogen-ready boilers etc.)
- Evidence to demonstrate it is safe to use hydrogen in our homes (i.e. safety assessment)
- Evidence to prepare for a community trial (i.e. social research focus group results)
- GDNO's identifying locations for community trials of about 300 homes







**Hy4Heat**