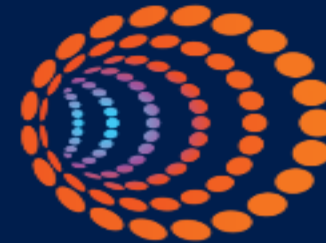


Hydrogen 100



Mark Wheeldon
Hydrogen Program Manager
LCNI 2018
October 2018



SGN
Your gas. Our network.

A reminder of SGN

Upgrade

1,000km mains
replaced per year



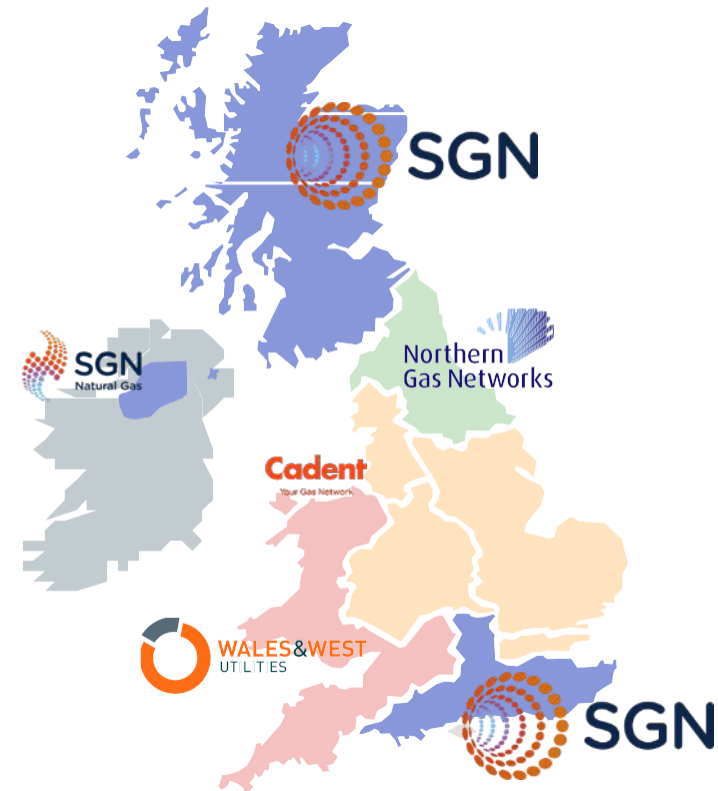
Connect

20,000 connections
(5,000 fuel poor) per year



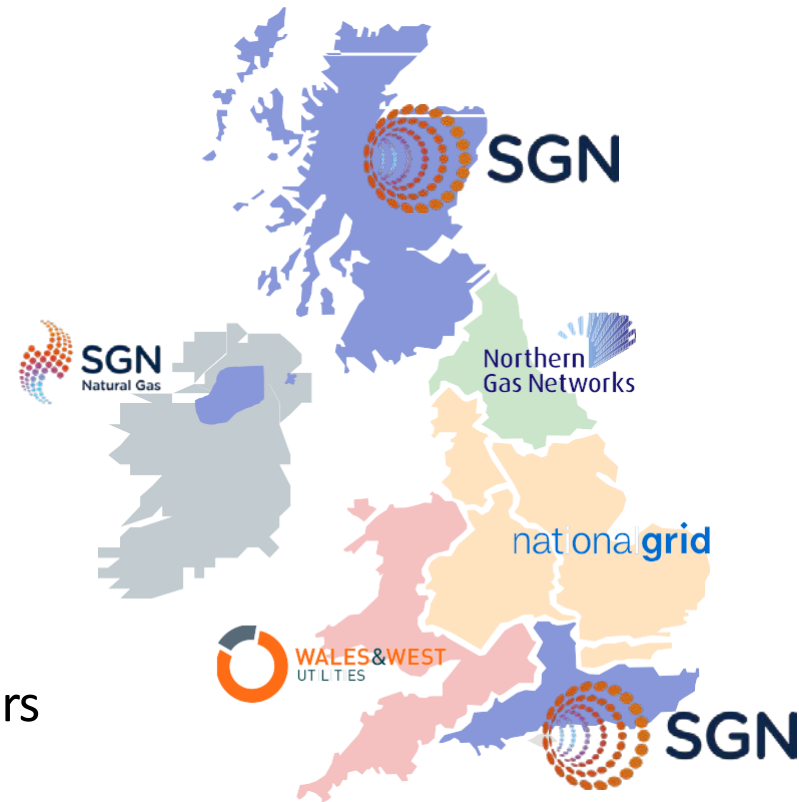
Emergency

230,000 calls
50,000 repairs per year

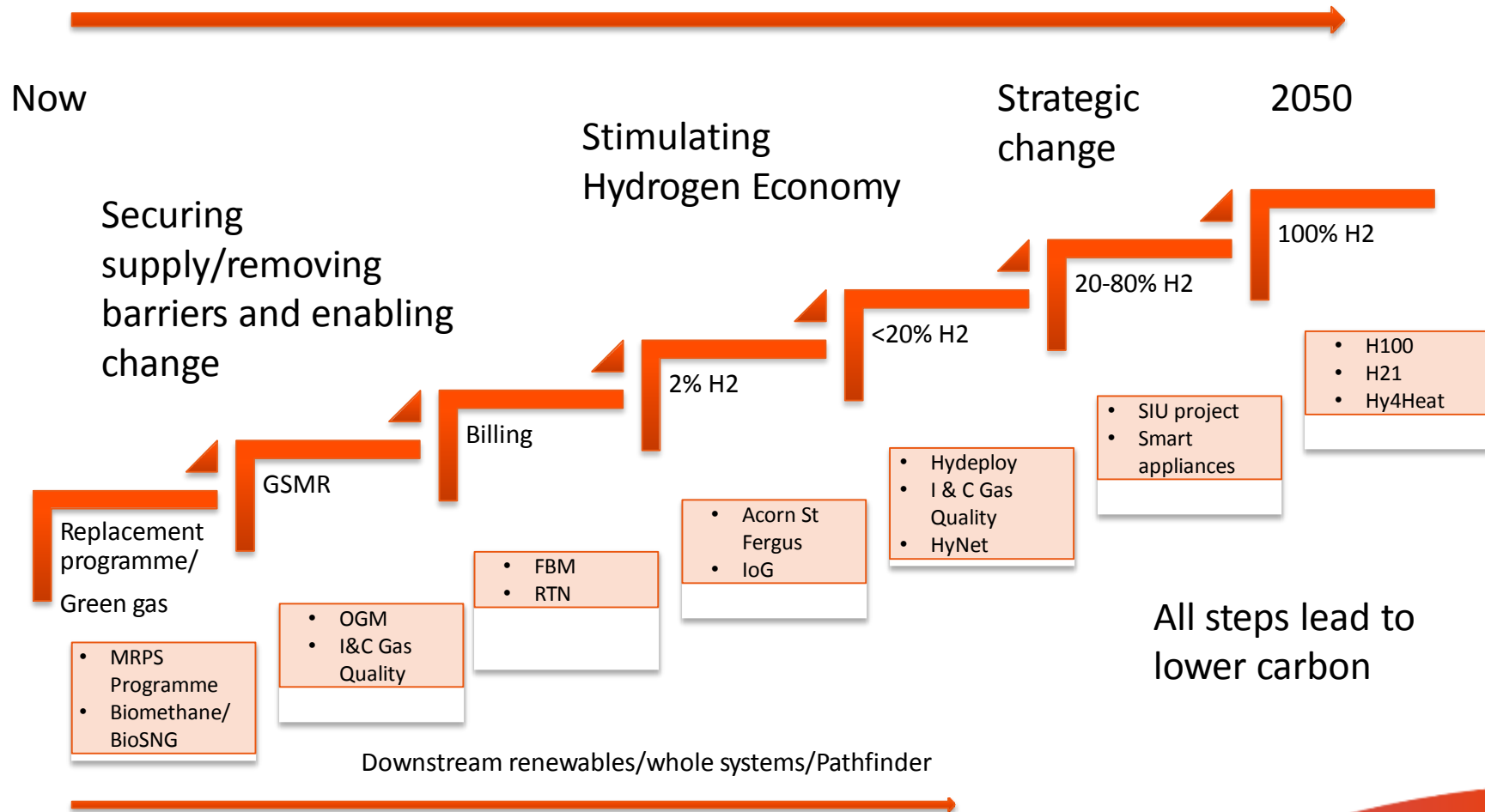


SGN in Scotland

- 25,000km of pipeline
- 1.8m meter points, 4.5m people
- 15 biomethane plants connected
- 300km metal mains replaced with plastic pipe each year
- Connections - 12,000 p.a.
(3,000 fuel poor p.a.)
- 1,400 employees plus 400 contractors



Future Energy Scenarios – Networks Gas quality decarbonisation pathway



H100 Overview



Feasibility & FEED Study



First Hydrogen distribution Network

- work program consists of 16 projects



2 phases

- Feasibility – 4th quarter 2019
- Construction – Summer 2021



Will demonstrate safe, secure & reliable distribution of Hydrogen



Project snapshots

- Odorant
- as Detection



Phase 1

Scope

Feasibility, FEED & Safety case

The objectives being;

- To determine the viability from both a technical and economic viewpoint of constructing the first 100% Hydrogen network.
- To develop the safety case, compliance framework and safe systems of work necessary to design, construct and operate the first H2 distribution network.

Method

Three feasibility studies that will run concurrently

All three studies will have the same scope but will be conducted in different locations with very different existing and potential network features.

Study one

Levenmouth, Fife

Study two

MACC Developments Ltd,
Machrihanish Airbase

Study three

Aberdeen conference
Centre, Aberdeen



Hydrogen 100



H100 Feasibility
study
(work program)

Compliance framework

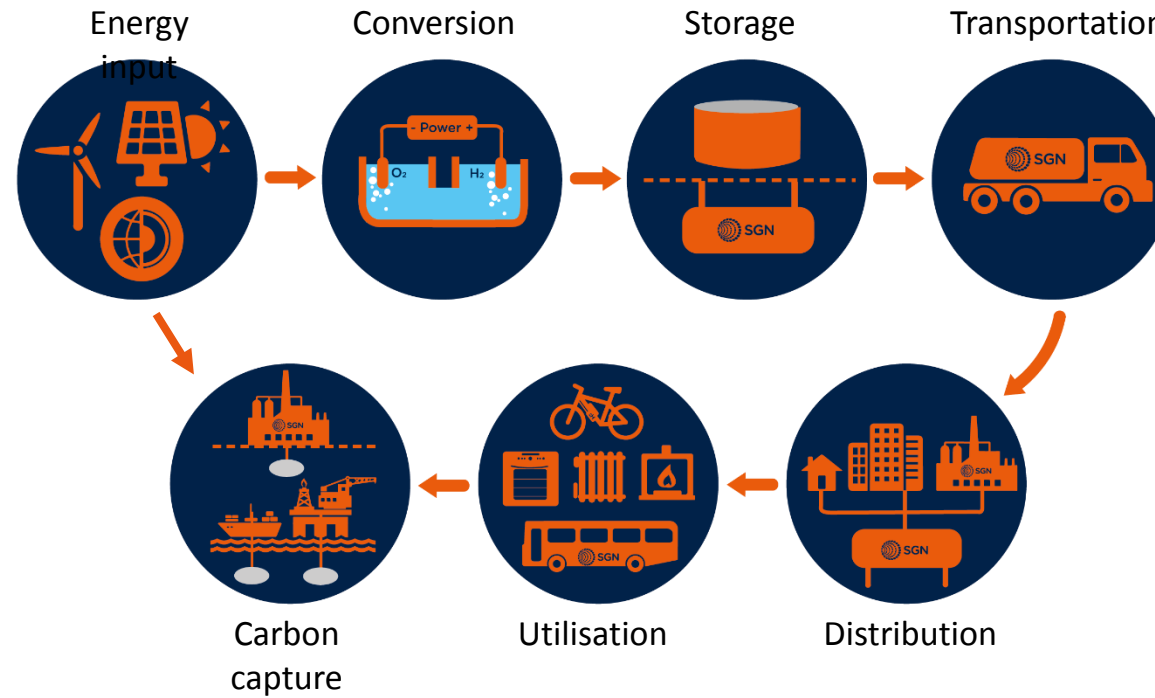
1. Stakeholder and customer strategy
2. Safety case & Operational procedures
3. PE materials and jointing techniques
4. Characteristics of hydrogen
5. Consequence testing (NDT & DT)
6. Hydrogen logistics (Production & Supply)
7. Metering & Appliance validation program
8. Odorant & Gas Detection
9. Commercial arrangements
10. Academic partnership

Technical & commercial viability

- A. Site agreements**
Levenmouth, Machrihanish & Aberdeen
- B. Site feasibility studies**
Technical and Commercial Viability, recommendations and options for each site
- C. FEED**
Technical requirements, Cost of execution, Risk.

H100 final report
options and
recommendations

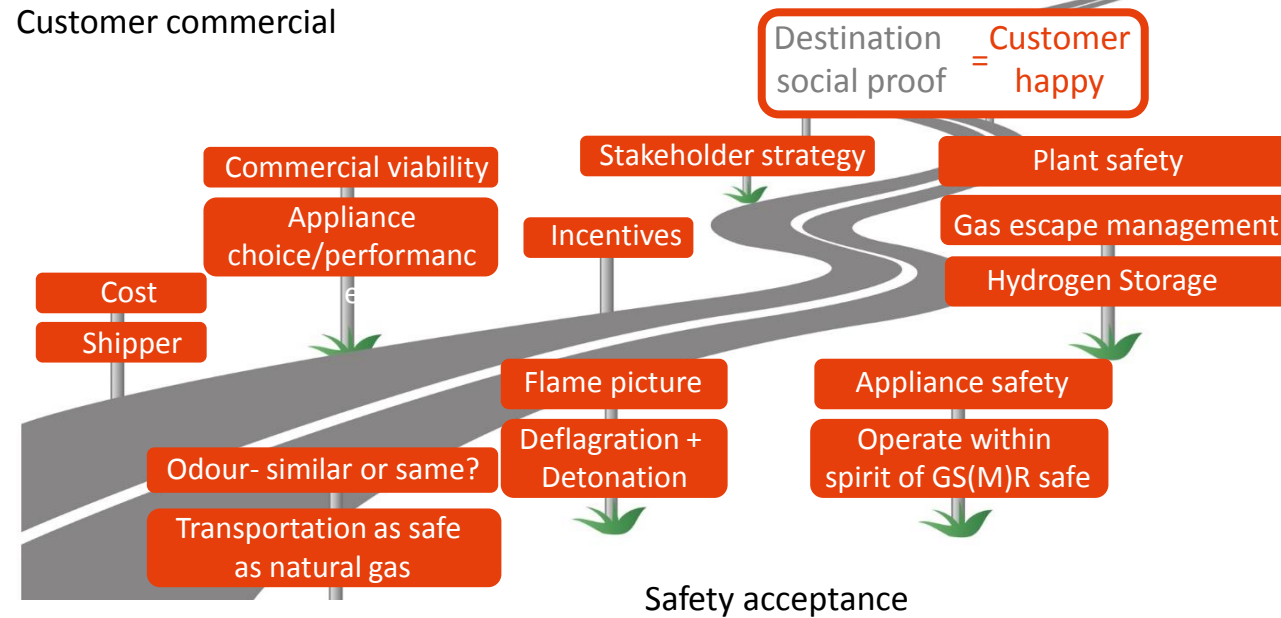
Hydrogen network



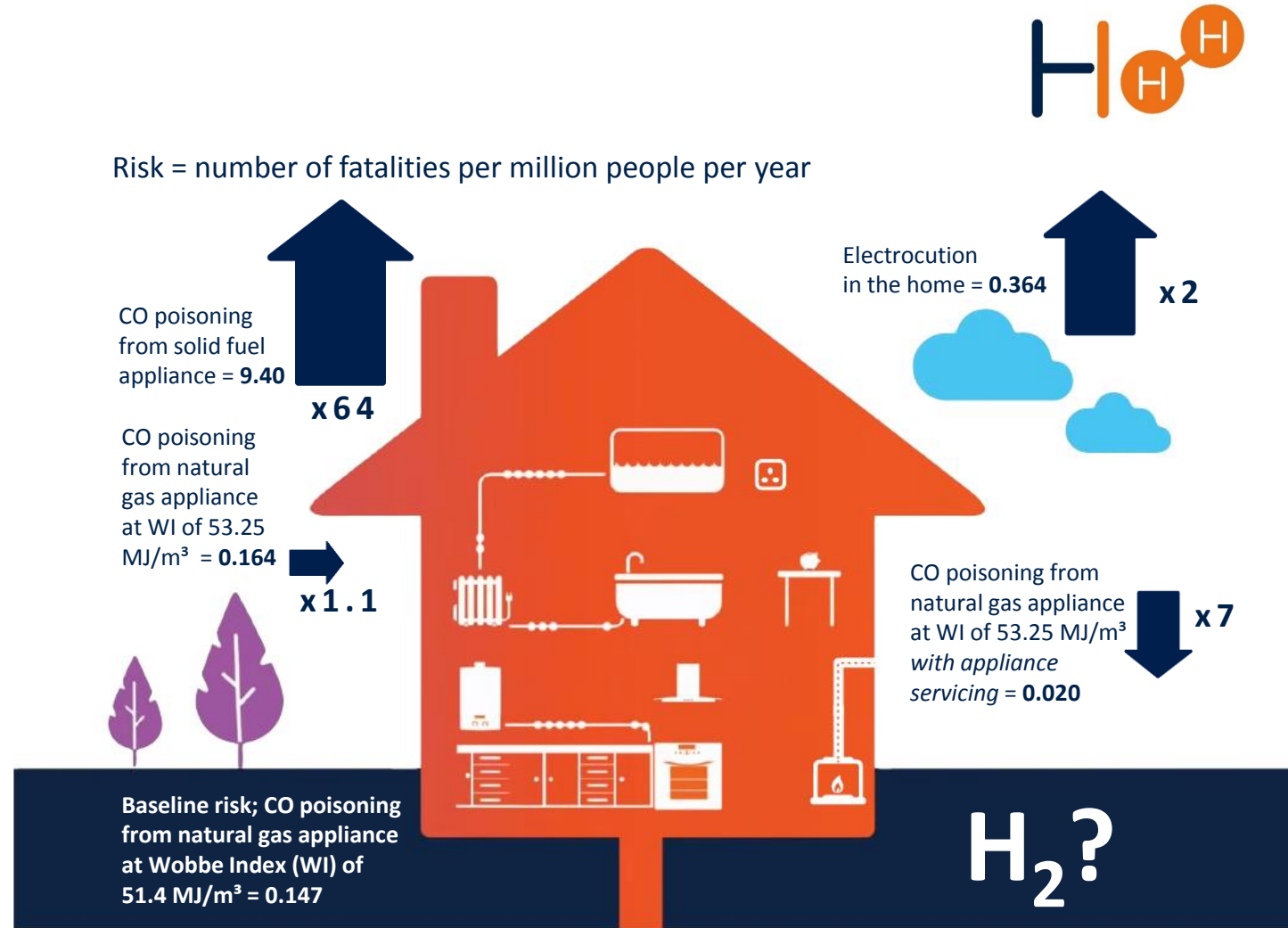
H₂ Road to social proof



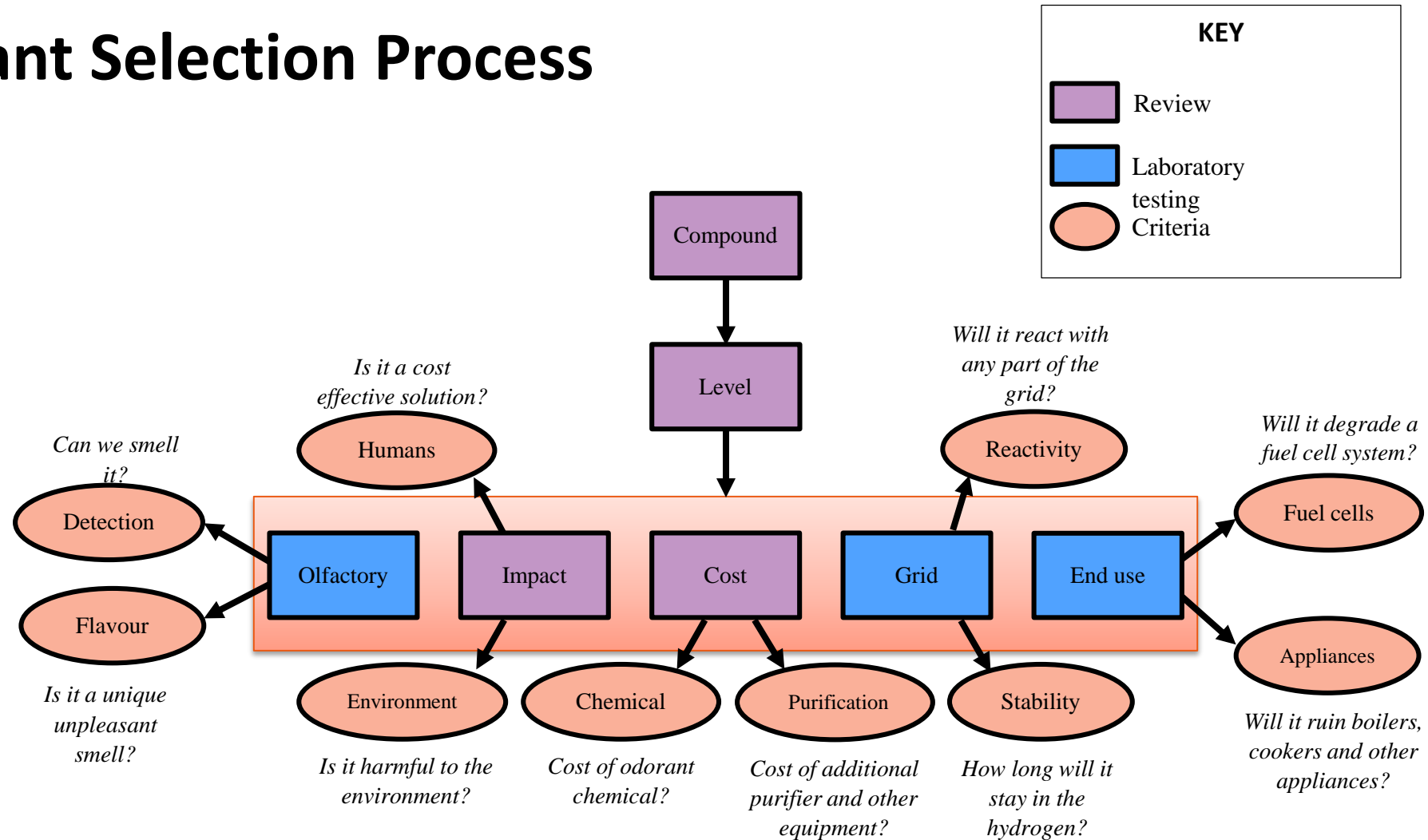
H₂ conversion



Relative risks to the home



Odorant Selection Process



Candidate odorants to be tested



NPL recommendations based on findings:

	Odorant compound	Rationale
1	Odorant NB (78% TBM, 22% DMS)	In use by SGN and UK
2	Standby odorant 2 (34 % Odorant NB, 64 % Hexane)	In use by SGN
3	Odorant THT (100 % THT)	In use by SGN and Europe
4	GASODOR-S-FREE (34% MA, 601% EA, 2.5% EMP)	Sulphur-free odorant in use in Germany
5	5-ethylidene-2-norbornene	Suitable for fuel cells with unpleasant odour



Gas Detection

Identify a suitable portable hydrogen gas detector for use by FCO's and Engineering teams that can differentiate between trace hydrogen and Natural Gas.

Outputs to date:

- It has been established that a dual use instrument is not available and would need to be developed.
- A number of gas detection instruments are being tested
- Specification for dual Gas instrument being developed

Thank you



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