



Implats and a Hydrogen Economy

February 2018

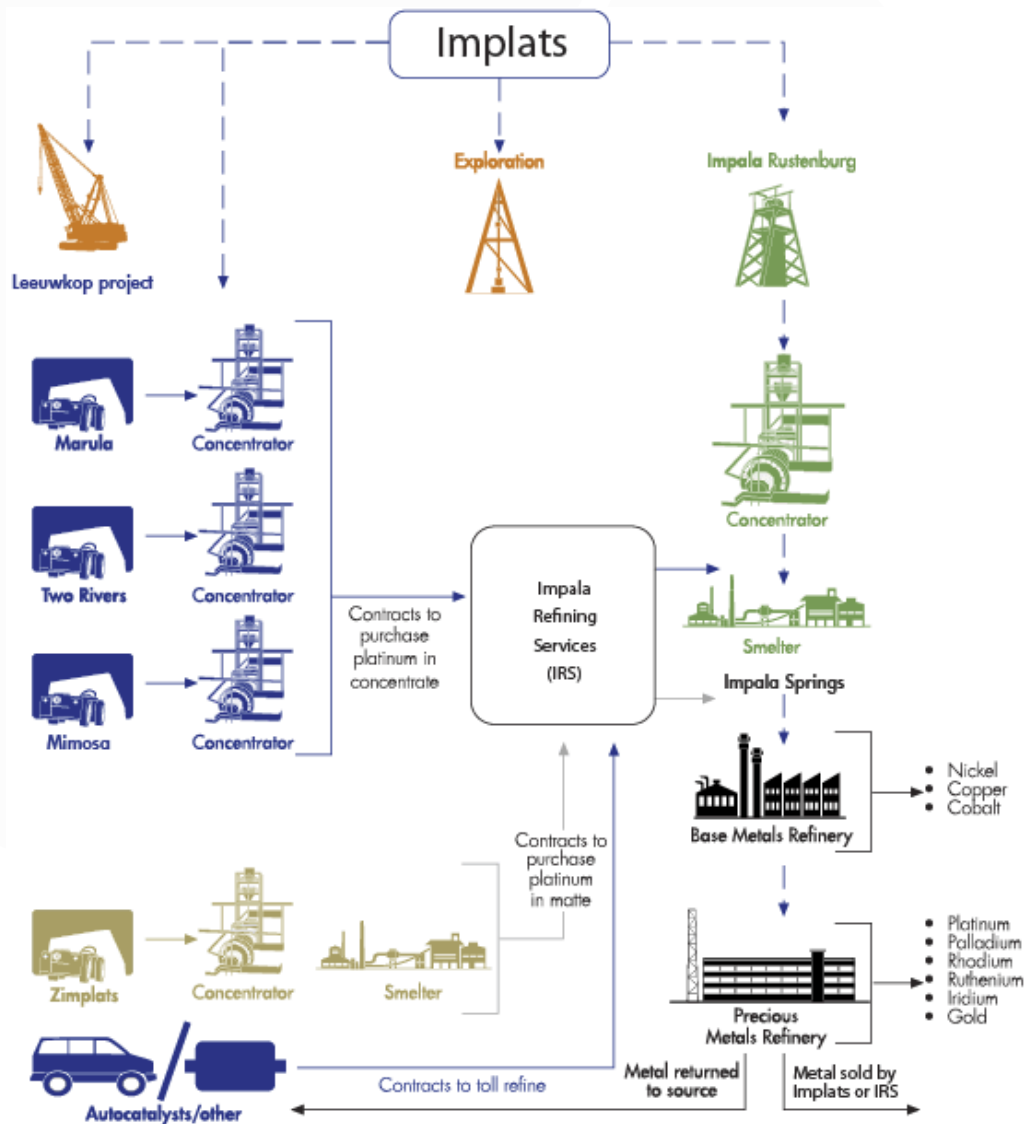
Fahmida Smith
Market Development Manager

1. Who we are
2. Why a Hydrogen Economy
3. Implats' Fuel Cell Roadmap
4. Our Projects

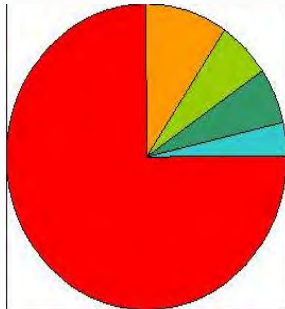
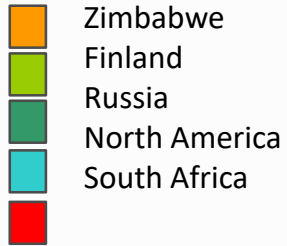


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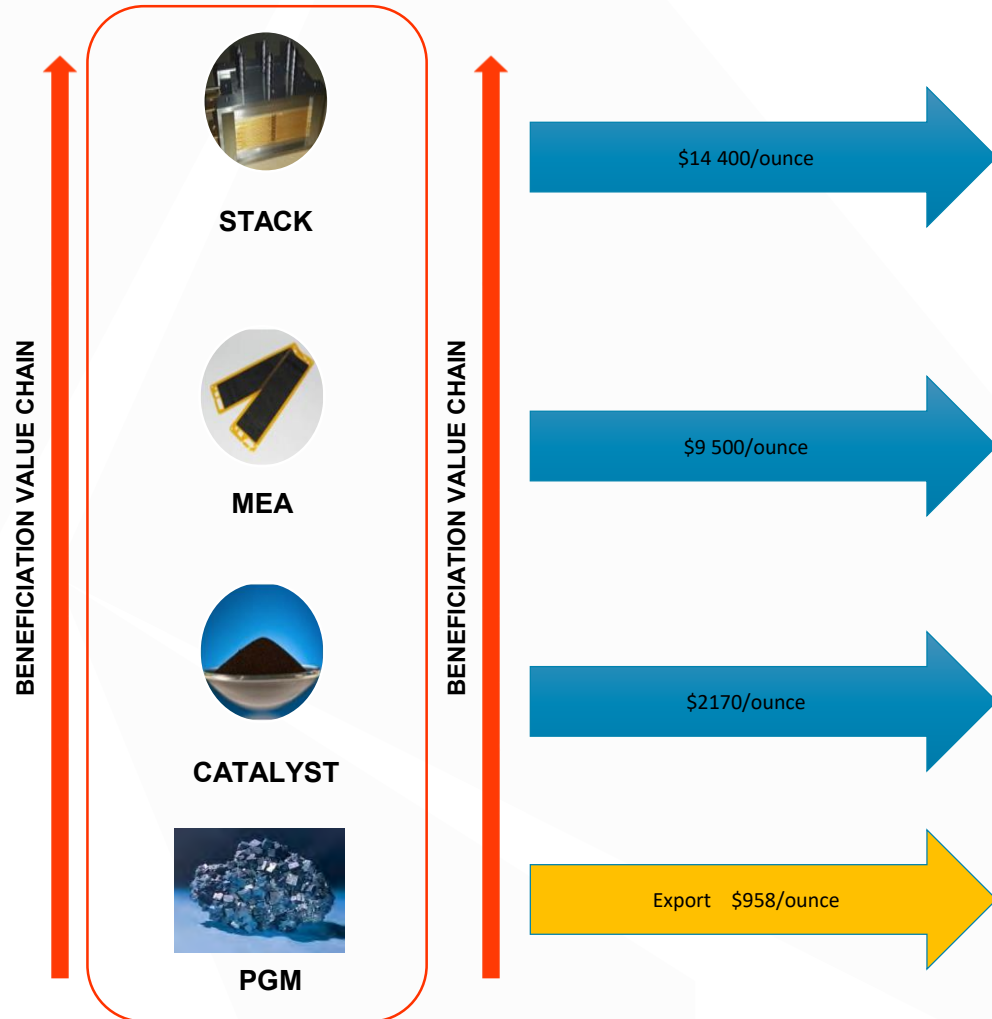
Implats – mining, refining and marketing of base & platinum group metals

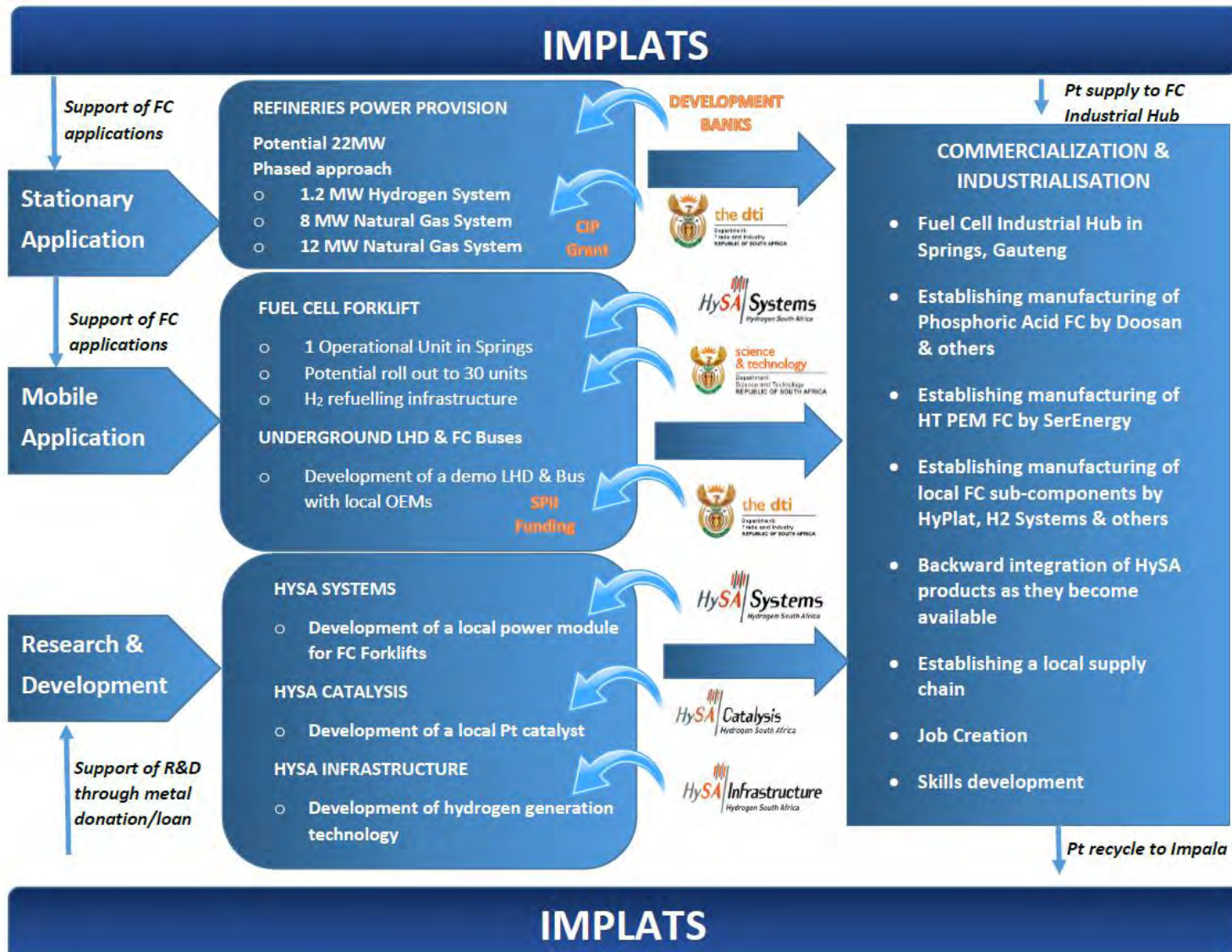


World Platinum Reserves

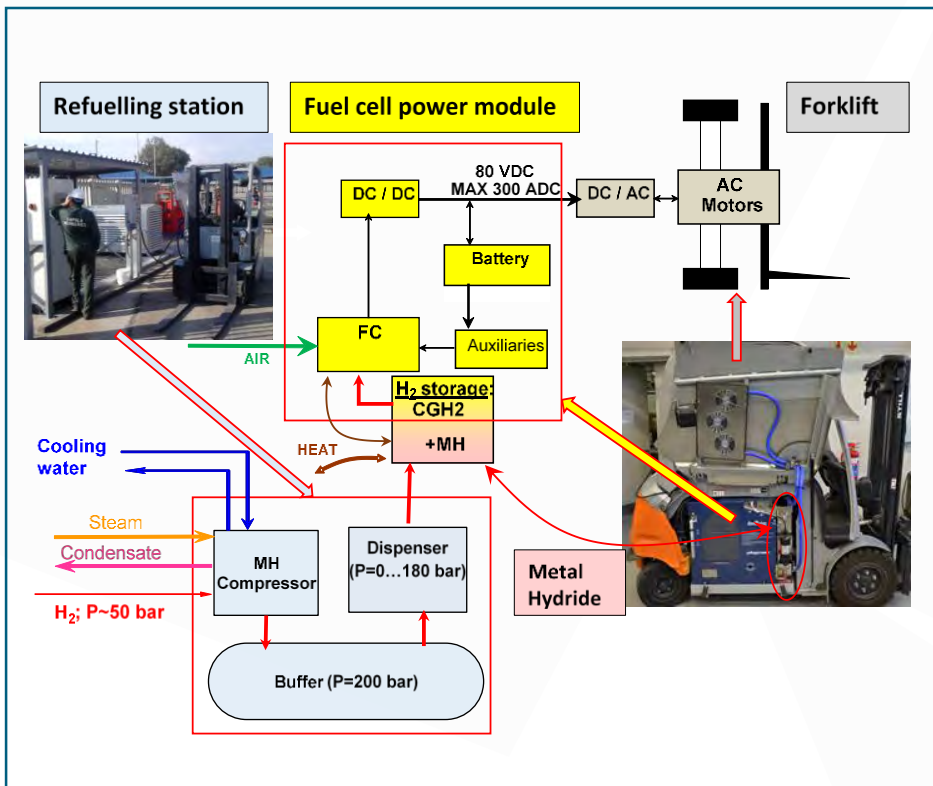


South Africa possesses
75% of global Pt
reserves





Fuel cell forklift and refuelling station



- Fuel cell supplies the base load power
- Combined with a battery to allow for operation at peak power loading
- On-board metal hydride containers store the hydrogen at lower pressures
- Installed hydrogen supply pipeline
- Hydrogen is compressed
- Compressor is thermally driven and consumes steam and cooling water instead of electric power
- Higher pressure hydrogen is stored in a cylinder pack

Fuel cell forklift and refuelling station



Re-fuelling
Station

Copper
dispatch



Re-fuelling

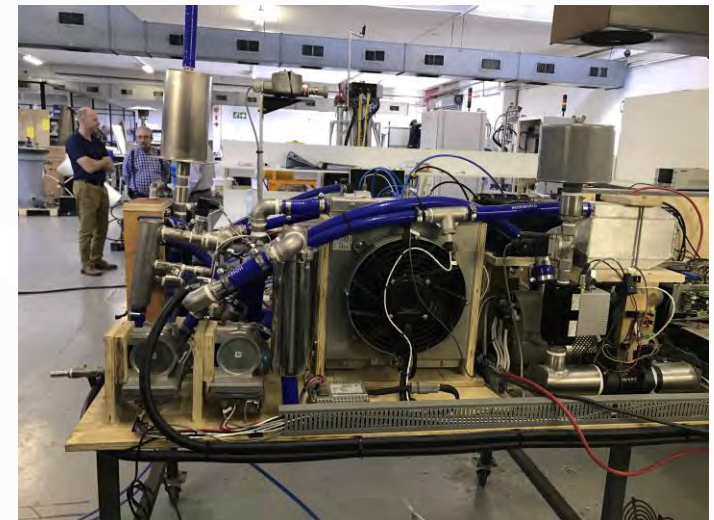
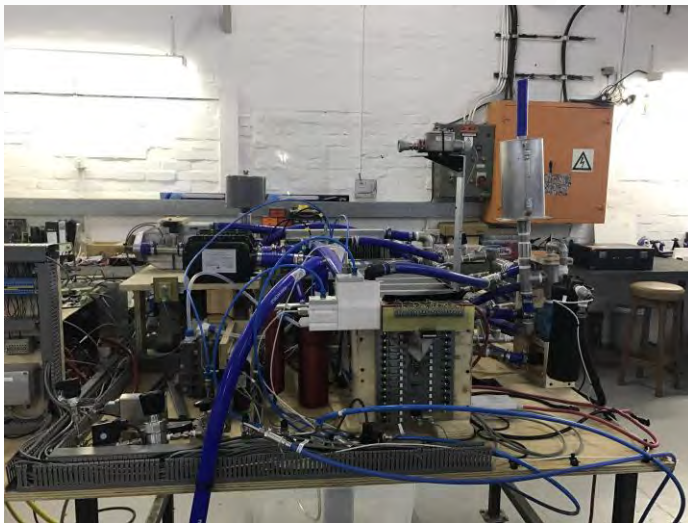


- Launched March 2016
- Operational for a year and a half
- First service on forklift, fuel cell and refuelling station
- Prototype proof of concept
- Need to industrialise the unit for commercialisation – importance of demonstration projects



Fuel cell forklift – Development of a local power module

- Local design – HySA Systems and Hot Platinum
- Use of commercial stack
- Desktop assembly complete
- Testing in progress
- Lead encased hydride cassettes are being produced – IP sensitive
- Next steps: integration into a 3 tonne forklift



- Piped Hydrogen
 - Sasol via Air Products
 - 99 % Pure Hydrogen
 - 55 Bar
 - 6 tonnes/day
 - Av. 3.2 tonnes/day consumption rate
 - Line sized for 16 tonnes/day
 - 22 month expansion time frame
- Operating Parameters
- Ease of integration
 - Refuelling
 - Hydrogen Compression
- Range on vehicle
- Frequency of refuelling
- Demonstrate novel technology in South Africa
- Develop local skills and supply chain



A fuel cell Special Economic Zone (SEZ) through commercialisation

- Provision of serviced land for the SEZ
 - 16 Ha Land
 - GIDZ & Ekurhuleni Metropolitan Municipality
- Guarantee of platinum metal supply
- Closed looping of platinum
- Promotion of industrialization
- Potential to enhance overall competitiveness
- Potential to significantly grow knowledge - based jobs
- Provision of new opportunities for other key industry sectors
- A platform to grow high value exports
- Opportunity for South Africa to:
 - ❖ reducing global greenhouse emissions
 - ❖ diminishing urban pollutants
 - ❖ improved quality of life





science & technology

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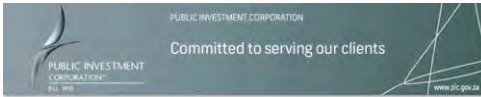
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sasol
reaching new frontiers



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