International Partnership for Hydrogen and Fuel Cells in the Economy

South Africa: Identification of skills needs for hydrogen economy

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LABOUR MARKET INTELLIGENCE

higher education & training
Department: Higher Education and Training
REPUBLIC OF SOUTH AFRICA

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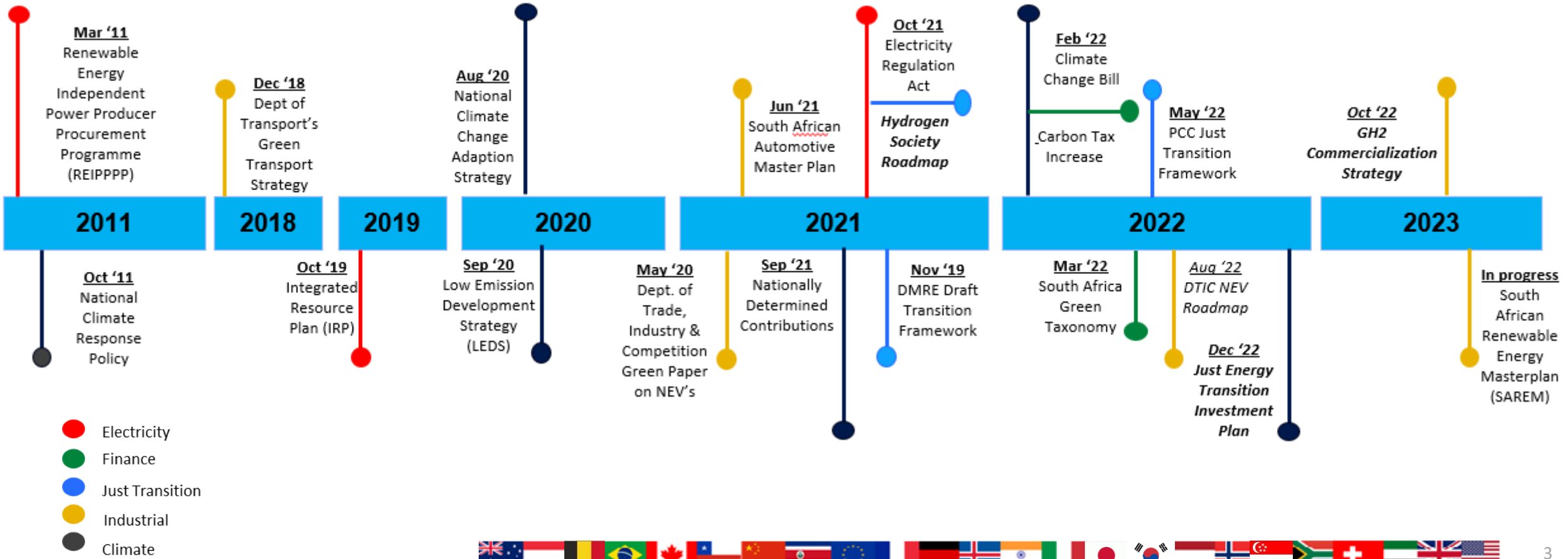
Presentation outline

1. Policy roadmap
2. Identification of skills needs for the Hydrogen Economy
3. Methodology and approach
4. Summary of findings
5. Value add of the skills need assessment
6. Initial conclusions

Policy Roadmap

- South Africa's commitment to transition to a low carbon economy is informed by the country's energy and climate policies:



Identification of skills needs for the Hydrogen Economy

- Following the pledge by the International Partners Group at COP26, South Africa published its **Just Energy Implementation Plan** at COP27 which laid out its priority investment requirements.
- Just transition initiatives are elaborated within 3 priority sectors (Electricity; New Energy Vehicles; **Green Hydrogen**) and two cross-cutting priorities (**skills development** and municipal capacity).
- Understanding the impact of energy transition on skills open-up avenues to identify the **occupations, knowledge and attributes** that are likely to be required in these priority sectors & help prepare the current energy workforce to transition to these sectors.
- South Africa has embarked on a **Labour market Intelligence (LMI) research programme** to foreground the skills needed by the electricity, new energy vehicles & green hydrogen sectors in the country's **Human Resource Development Strategy (HRDSA)** and its **Master Skills Plan (MSP)**.

HRDSA & MSP

- The goal is one country, one strategy, one plan
- All-encompassing response by the **social partners** to ensure an adequate human resource pool to meet South Africa's fledging socio-economic needs and address skills supply and demand imbalances in the labour market
- As part of the LMI research programme, South Africa is currently undertaking a skills needs assessment for the Hydrogen Economy
  - Considers all the occupations that will be required across all segments of the emerging green hydrogen value chain.
  - The assessment also includes identification of skills gaps (capabilities) as well as possible interventions.

Key research questions

1. What is the current and future demand for “skills” required for the hydrogen economy?
2. What is the available supply of skills for the development of the hydrogen economy?
3. What skills imbalances are envisaged for the development of the hydrogen economy?
4. Are the qualifications, programmes and curricula offered at South African Higher Education Institutions (HEIs) appropriate for the development of the hydrogen economy?
5. Are there sufficient opportunities for workplace-based learning (WBL) for Hydrogen Economy related skills in South Africa?

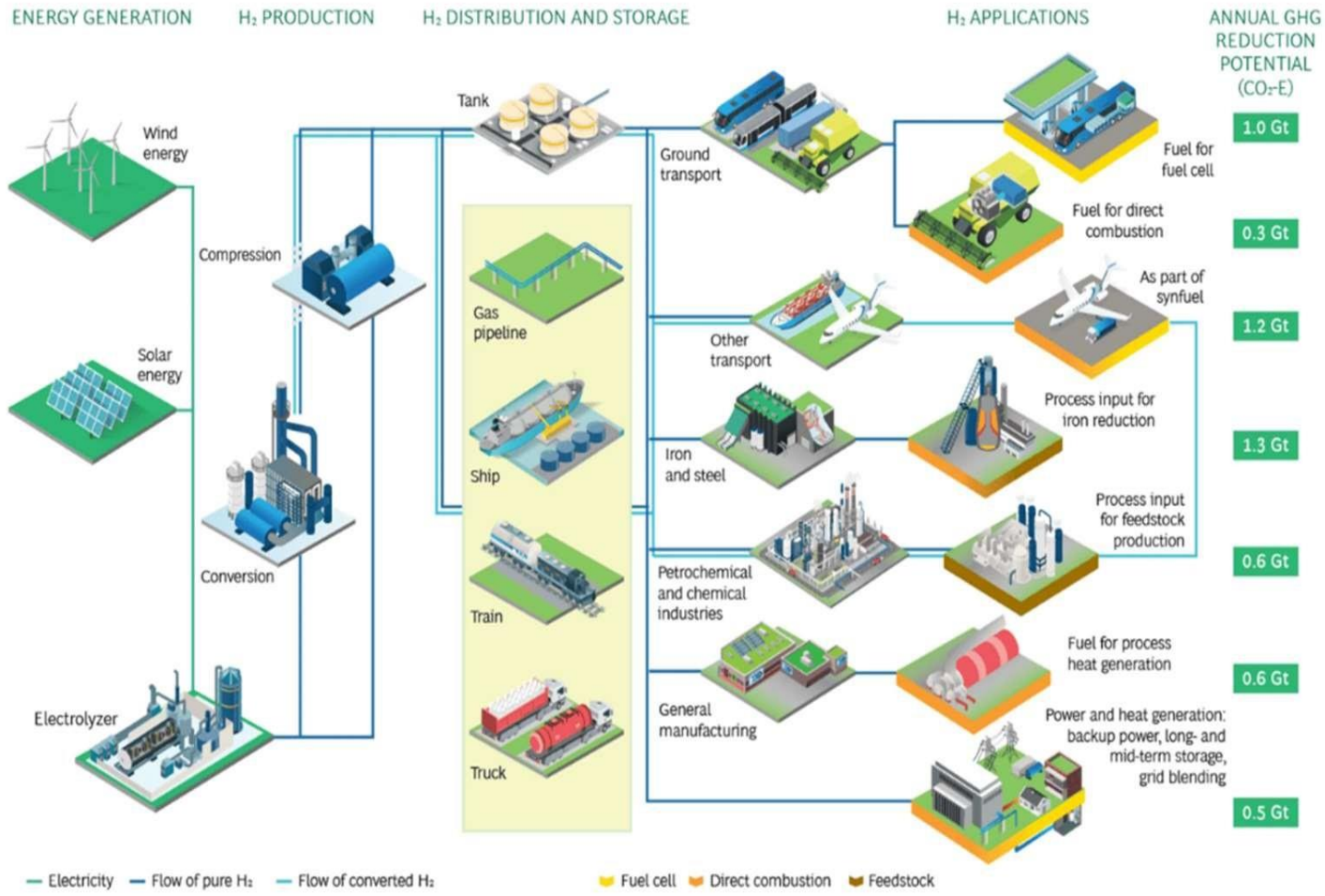
Methodology and approach

Capability-centric skills needs analysis

Secondary data collection and analysis	Primary data collection and analysis	Interventions and Recommendations
• Following a value chain approach focused on production, distribution and storage and end use, • International studies - Australia, Canada, France, EU, ILO • National studies – SAIAA, • Current hydrogen economy – SASOL, Petro SA, Linde, etc.	• Stakeholder engagements • Government and Skills Sector Authorities, private sector, industry bodies, research and labor.	• Addressing the skills gaps, • Recommendations for new skills development, • Recommendations for work-based learning interventions.

Demand for Skills for GH2

Capability-centric skills needs analysis



Supply of skills for GH2 and envisaged skills imbalances

Capability-centric skills needs analysis

- Current supply of hydrogen skills in South Africa is concentrated with a few chemical companies, research institutions.

Causes of skills imbalances	Comments
Skills surplus	• Nascent industry – Currently no surplus of hydrogen related skills in SA
Skills shortage	• Nascent industry – Currently no current shortage • As industry becomes established risk that the skills demanded by the industry > the skills that can be supplied
Skills mismatch: • Demand mismatch • Education supply mismatch • Qualification job mismatch	• Cannot be overcome by increasing number of graduates, • Review curriculum and changes to on-job training/reskilling programmes to include specific requirements for the green hydrogen economy.

Summary of findings

Capability-centric skills needs analysis

Occupations

Summary

- 138 Occupations
  - Skill level, required qualifications and Organising Framework for Occupations (OFO) codes
  - Engineers (35)
  - Technicians and tradespersons **(39)**
  - Specialists (38)
  - Managers (15)
  - Elementary skills (11)

Summary

- 185 hydrogen specific capabilities required for the 138 occupations:
  - Hydrogen production
  - Hydrogen storage
  - Hydrogen Distribution/Transportation
  - Hydrogen end-use application
  - Cross cutting capabilities

University Qualifications

74 Bachelors' degrees and diploma's

- Engineering,
- Sciences,
- Technology,
- Management & support qualifications

- 67% of required bachelors' degrees and diplomas currently offered in SA institutions
- No hydrogen qualifications at undergrad level
- Few post-grad programmes/research opportunities

TVET College Ecosystem

- No hydrogen qualifications in NC(V), NATED and Occupational Qualifications
- Mainly engineering qualifications which can help provide foundational knowledge and skills
  - National Certificate Vocational Qualifications - NC(V): 7
  - NATED – 3
  - Occupational Qualifications – 27

Initial Conclusions

- South Africa needs to develop the right skills to service the emerging hydrogen economy
- Main takeaways:
  - ✓ SA has required occupations (although not in large quantities)
  - ✓ SA institutions do offer most of the required qualifications (university level and TVET college eco-system)
  - ✓ HOWEVER, augmentation is required for both occupations and existing qualifications
  - ✓ Introduction of new qualifications and creation of new occupations (smaller extent)
  - ✓ Shortage of WBL opportunities (nascent industry)

Thank you

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