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

CSIR
Touching lives through innovation

LABOUR MARKET INTELLIGENCE

LMI Report on Skills Needs for the Economy

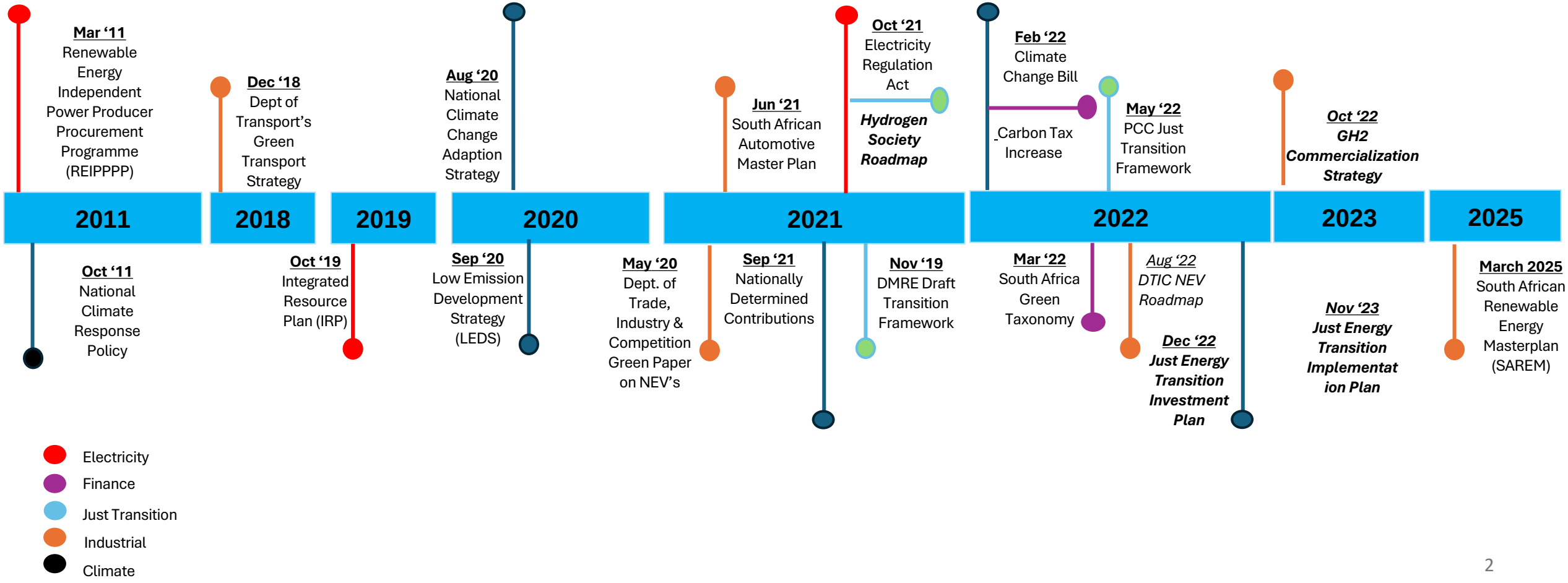
Identification of skills needs for hydrogen economy

H2.SA Expert Exchange Webinar: Skills Development for GH2 & PtX

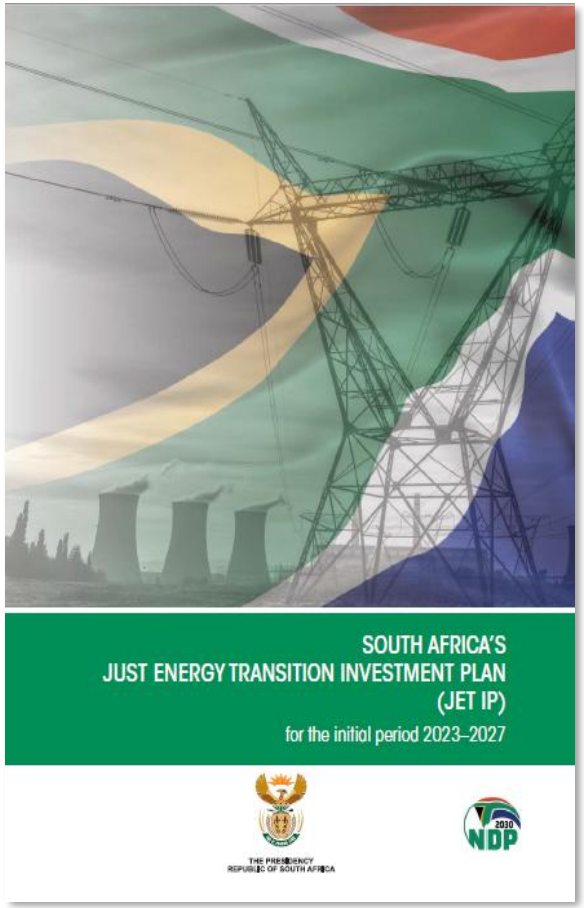
Ms Mamphokhu Khuluvhe
Director: System Monitoring & Labour Market Intelligence
Department of Higher Education and Training

Policy Framework

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

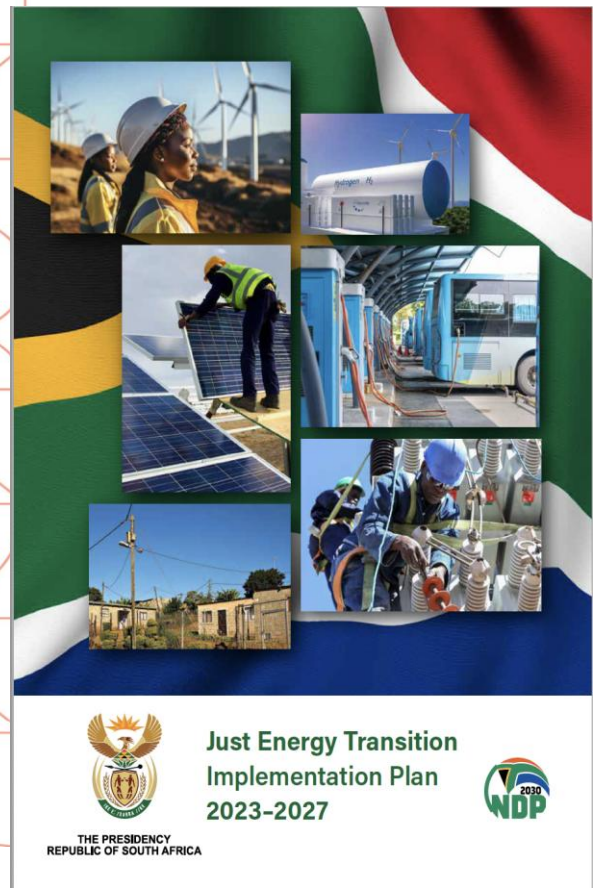


Just Energy Transition Investment Plan 2023-2027



- The **Just Energy Transition Investment Plan 2023-2027** was published in 2022.
- It outlines South Africa's financing needs to reduce greenhouse gas emissions to 350-420 mega tonnes (Mt) of carbon dioxide equivalent (CO2e) per year by 2030.
- This is in line with South Africa's Nationally Determined Contribution (NDC) lodged with the United Nations Framework Convention on Climate Change (UNFCCC) in 2021.
- The NDC commitment is contingent on South Africa securing international financial support.

Just Energy Transition Implementation Plan (JET IP)



- The **Just Energy Transition Implementation Plan (JET IP)** is the implementation plan for the Just Energy Transition Investment Plan 2023-2027.
- Published in 2023, the JET IP serves as a roadmap for South Africa to advance its decarbonisation commitments outlined in the Just Energy Transition Investment Plan 2023-2027.
- The JET IP defines short- and medium-term outcomes across six key Portfolios (chapters), with designated state institutions leading each area of work.
- The six JET Portfolios are: Electricity, Mpumalanga Just Transition, New Energy Vehicles (NEVs), Green Hydrogen (GH2), **Skills**, and Municipalities.
- In the case of the **Skills Portfolio**, the Department of Higher Education & Training (DHET) is the lead institution.

Education Policy Alignment for JET Implementation

The goal is one country, one strategy, one plan

Reconceptualised HRDS-SA
A framework that outlines the country's human resource development priorities

MSP
*It is the **implementation plan** of the HRDS-SA and focuses on ensuring an adequate skills pool to meet the country's needs*

FOUR KEY GOALS

Goal 1: Improving Early Learning and Schooling Outcomes

Goal 2: Improving the Employability for Youth who are not in Employment, Education and Training (NEET)

Goal 3: Improve the responsiveness of the PSET system to skills demand

Goal 4: Improve Governance, Leadership and Management in the Public Sector

HRDS-SA and MSP Key Targets in Response to the JET IP

OBJECTIVE	INTERVENTION	INDICATOR
GOAL 2: IMPROVE EMPLOYABILITY FOR YOUTH WHO ARE NOT IN EMPLOYMENT, EDUCATION AND TRAINING (NEET)		
2.1 Expand the provisioning of in-demand short courses	2.1.1 The DHET (through the LMIP) will produce an annual in-demand short course list.	▪ In-demand short course list.
	2.1.2. Undertake training programmes linked to the list of short courses in demand.	▪ Number of NEETs who complete in-demand short courses. ▪ The DHET submits a report on training on short courses to the HRDC.
2.2. Increase work-based learning (WBL) opportunities for NEETs	2.2.1 Increase the number of NEETs enrolled in WBL through internships, apprenticeships and learnerships.	▪ Number of NEETs enrolled in internships, apprenticeships and learnerships. ▪ The DHET submits a report on WBL opportunities for NEETs to the HRDC.
2.3. Increase entrepreneurship development opportunities for NEETs	2.3.1 Establish an Entrepreneurship Development Forum (EDF) to coordinate and increase NEET entrepreneurship development programmes.	▪ EDF is established. ▪ Presentations by EDF to HRDC.
2.4. Strengthen the coordination of youth employment schemes	2.4.1 SETAs establish a Youth Employment Forum (YEF).	▪ YEF established. ▪ Presentations by YEF to HRDC.

HRDS-SA and MSP Key Targets in Response to the JET IP

OBJECTIVE	INTERVENTION	INDICATOR
GOAL 3: IMPROVE THE RESPONSIVENESS OF THE PSET SYSTEM TO SKILLS DEMAND		
3.1. Align skills supply to labour demand in the economy, green and digital skills development	3.1.1 Identify skills needed to support the *Just Energy Transition Plan (2021)* and *the National Digital and Future Skills Strategy* (2020).	▪ Report on skills supply, demand and imbalances concerning *JET.*
		▪ Report on skills supply, demand and imbalances concerning the *NDFSS.*
	3.1.2. Provide career guidance to promote enrolment in green and digital skills programmes.	▪ Progress reports on career guidance programmes for green & digital programmes.
		▪ Number of learners completed green and digital skills programmes in TVET Colleges and universities.
	3.1.3 Undertake programmes to reskill and upskill displaced workers as part of the JET.	▪ Number of displaced workers who are reskilled or upskilled.
		▪ Progress reports on upskilling and reskilling programmes as part of JET.

MTDP Priorities for the 7th Administration & Key Considerations for the Sector

1. **Inclusive growth & job creation**
   - **A Just energy transition**
   - Increased employment opportunities
   - Re-industrialisation, localisation and beneficiation

2. **Reduce poverty and tackle the high cost of living**
   - **Skills for the economy**
   - Improved education outcomes and skills
   - Social cohesion and nation-building

3. **Build a capable, ethical & developmental state**
   - Improved governance and performance of public entities
   - A capable and professional public service

❖ **These priorities are interrelated and interlinked.**

Summary of Key Targets Emanating from the MTDP

For the 2025-2029 period, DHET will focus on delivering following 10 targets:

1. **7 000** Graduates in JET relevant skills produced by 2029 (Engineering – naval architecture and marine, Hydrogen and Green economy skills, digital skills)
2. **500 000** students placed in workplace-based learning (internships, learnerships, TVET students or graduates placed in work integrated learning) by 2029 – Cumulative
3. **355 000** students registered in skills development programmes by 2029 – (Cumulative)
4. Tshwane University of Technology Giyani Campus established and fully operational by 2029
5. Phase 1 of the University of North-West mining campus completed (Construction in accordance with concept design completed) by 2029
6. PSET enrolments per annum: **1 173 640** in University, **600 000** in TVET colleges, **160 809** in CET colleges
7. The number of eligible university students receiving funding through NSFAS bursaries annually: **550 000**
8. The number of TVET college students receiving funding through NSFAS bursaries annually: **300 000**
9. Artisans produced: **30 000** (122 000 cumulatively by 2029)
10. **50 000** students and staff in PSET trained through the Civic Education and Health skills programme

JET IP Skills Portfolio

- To ensure that the JET is inclusive, the JET IP includes a dedicated chapter on skills development (Chapter 9).
- This chapter outlines five key flagship interventions designed to address skill gaps in the current and future workforce, focusing on three primary sectors: renewable energy and transmission, new energy vehicles, and green hydrogen.
- The proposed flagship interventions are:

1. Establishing a comprehensive three-tier JET skills ecosystem to coordinate and align skills development efforts.
2. Creating Skills Development Zones (SDZs) linked to the 3 priority sectors (RE, GH2, NEV).
3. **Conducting skills needs assessments for each core sector (RE, GH2, NEV).**
4. Enhancing capacity development for government and relevant institutions.
5. Promoting foundational skills development by upskilling educators and integrating innovative learning strategies.

Scope of Work

- Identify skills supply, demand and imbalance in relation to the hydrogen economy.
- Identify appropriate interventions to respond to skills needs in relation to the hydrogen economy.

Five 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 and TVET Colleges 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 as well as internationally?

Methodology and approach

Secondary data collection and analysis

- Following a value chain approach focused on production, distribution and storage and end use,
- International studies - Australia, Canada, UK, France and EU, IPHE,
- National studies – SAIAA,
- Current hydrogen economy – SASOL, Petro SA, Linde, etc.

Primary data collection and analysis

- Stakeholder engagements

Interventions and Recommendations

- Addressing the skills gaps,
- Recommendations for new skills development,
- Recommendations for work-based learning interventions.

Summary of findings

Capability-centric skills needs analysis

Summary

Summary

Occupations

- 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)

- 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

- 68 Bachelors' degrees and diploma's
  - Engineering,
  - Sciences,
  - Technology,
  - Management & support qualifications

- 71% 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

Currently limited WBL opportunities to develop the hydrogen-specific capabilities opportunities for hydrogen related skills exist, especially in countries where the hydrogen value chain is more developed.

Value Add

In an economy characterized by low-skilled worker force

Identifies required occupations and associated hydrogen specific capabilities

Identifies occupations which are not in the Organising Framework for Occupations (OFO)

Identifies qualifications that are required at university level and TEVT college ecosystem + hydrogen related capabilities required to augment current offering

Reduction in Skills Imbalances

Conclusion (1 of 2)

- The hydrogen economy is growing rapidly
- South Africa needs to develop the right skills to service the emerging economy (reduce socio-economic challenges)
- Main takeaways:
  - SA does have required occupations *(although not in large quantities)*
  - SA does offer most of the required qualifications (higher education, TVET college system and occupational qualifications)
  - ***HOWEVER,*** augmentation is required for both occupations and qualifications offered
  - Introduction of new qualifications and creation of new occupations (smaller extent)
  - Shortage of WBL opportunities (nascent industry)

Conclusion (2 of 2)

- No **CURRENT** skills shortage – **HOWEVER** risk of demand exceeding supply as industry is established
- Long term: Revise curriculum + train the lecturer and trainers
- The demand for specialized skills will however materialize before the longer-term project of updating curricula can be concluded. Therefore:
  - Develop CPD programmes.
  - Promote learner and trainer mobility to other countries.
  - Encourage students to enroll for STEM subjects in primary and secondary school.
  - Promote green hydrogen as an industry of choice to students and workers in declining sectors.

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

CSIR
Touching lives through innovation

LABOUR MARKET INTELLIGENCE

THANK YOU