

Workshop Energy Skills Roadmap Final Workshop

30 November 2022

Agenda



Welcome and introduction

09:00 – 09:05



Background

09:05 – 09:30



Process we have followed

09:30 – 10:00



Presentation of results for data and energy trends

10:00 – 10:45



TEA BREAK

10:45 – 11:00



Presentation of results on implications for skills

11:00 – 12:30



Way forward

12:30 – 13:00



Closure

13:00

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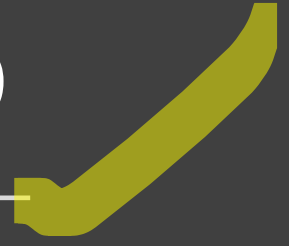
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CONTEXT

- The energy transition is happening globally, and the pace of change is accelerating
- The energy transition is resulting in sector coupling into related sectors, increasing the complexity
- Future skills will also be needed for other new technologies such as robotics, artificial intelligence, nanotechnology and 3D printing as these technologies are impacting our customers and suppliers
- According the WEF South Africa has a long way to go in order to improve its Just Energy Transition Readiness
- The transition provides many opportunities for South Africa, but the transition must be just
- Ensuring we have the right skills at the right place and at the right time will be a critical enabler



Definition from the IISD



Just
Equitable
Inclusive
Transition

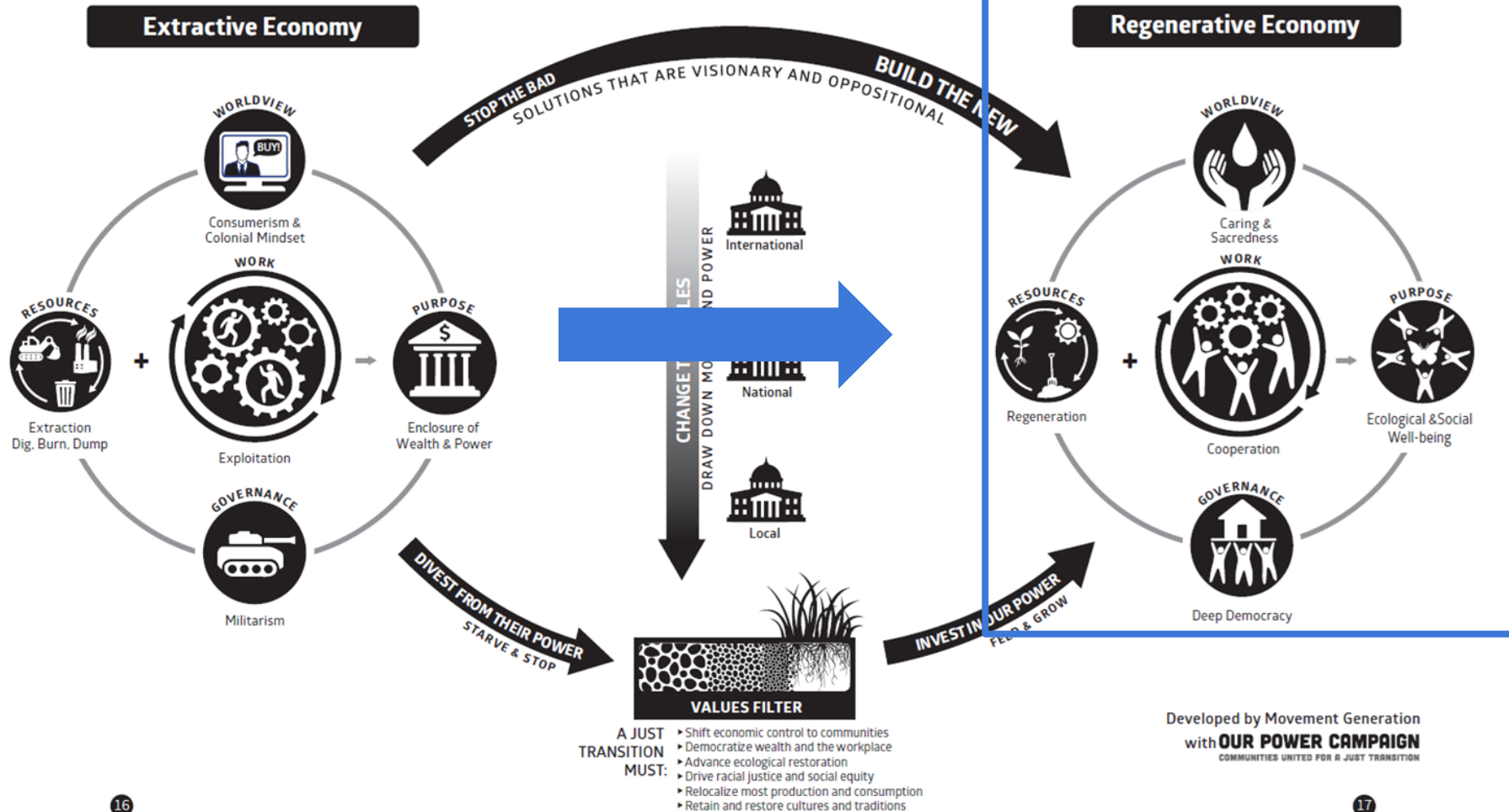


A just energy transition is a negotiated vision and process centred on dialogue, supported by a set of guiding principles, to shift practices in energy production and consumption. It aims to minimise negative impacts on workers and communities with stakes in high carbon sectors that will wind down, and to maximise positive opportunities for new decent jobs in the low carbon growth sectors of the future. It strives to ensure that the costs and benefits of the transition are equitably shared. (IISD)

The following three dimensions of justice need to be considered in the South African context:

- Procedural
- Distributive
- Restorative (after TIPS)

Implications of trends on jobs



Decarbonisation of the sector requires a major shift from fossil-fuels and a change in the country's energy mix. This will have significant implications on current jobs in the coal, oil and natural gas sectors. In turn a growth in clean and renewable energy provides an opportunity for those currently employed in these sectors to transition to sectors of growth, and the creation of new jobs.

Partners and key contributors (1)

This project is a partnership between the South African National Energy Association (SANEA) and the African Energy Leadership Centre (WITS/AELC) at WITS University Business School.

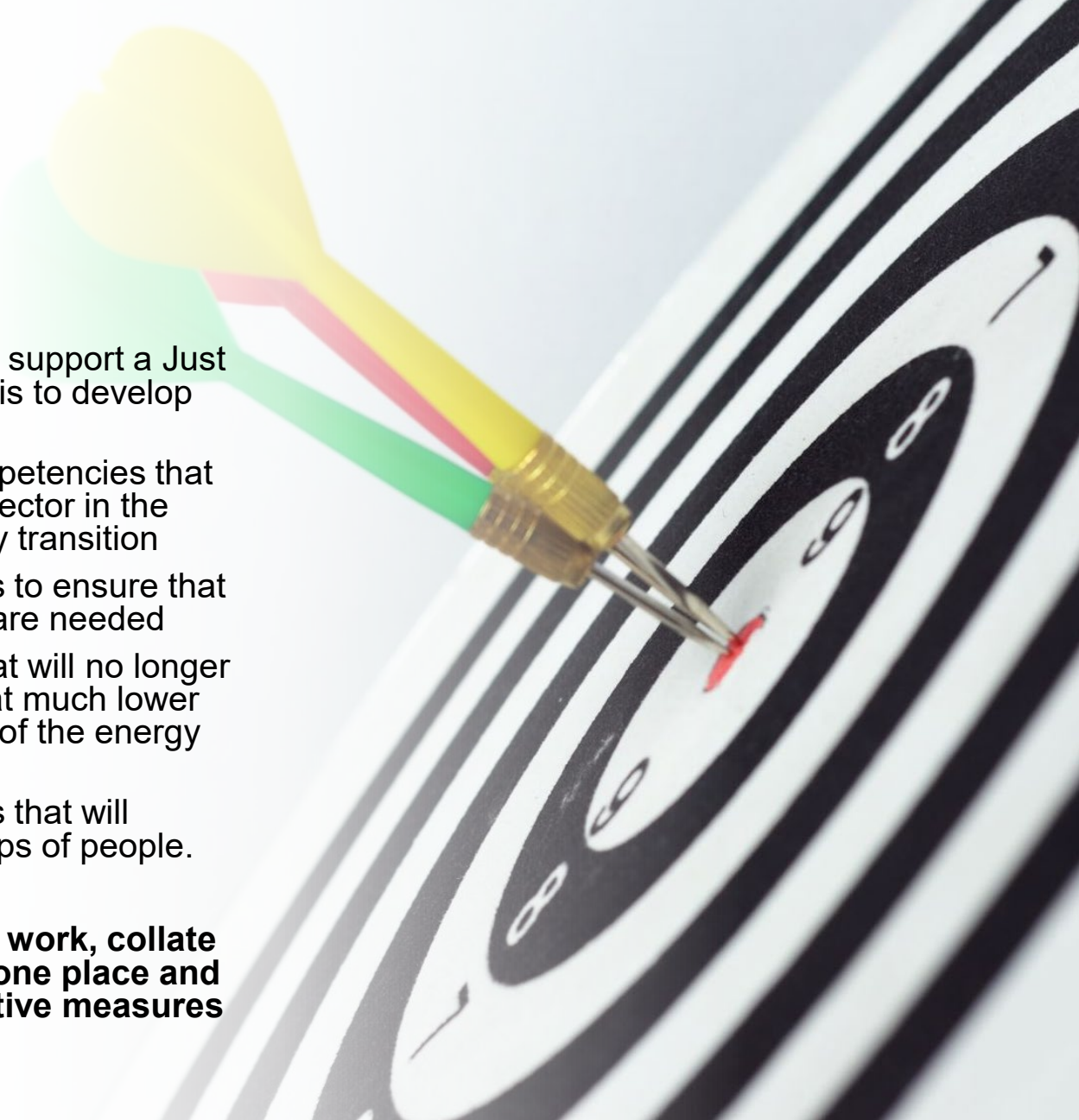
SANEA represents a hub for objective thought leadership on energy and related matters. In so doing, SANEA stimulates original thinking to catalyse a transformation of the South African Energy Sector. SANEA will be able to draw on its extensive network locally and internationally, to guide and lead this work. SANEA leads several energy sector projects aimed at contributing towards a just energy transition

Wits University's African Energy Leadership Centre is a first in Africa and designed to equip businesses, policymakers and other stakeholders with the interdisciplinary leadership skills necessary to manage the extensive transitions underway in the energy sector. It provides two cutting edge postgraduate courses in energy leadership as well as public outreach events and research

Partners and key contributors (2)

- In addition to the Advisory Committee, expert input will be sought through the South African Chapter of the BRICS Business Council (SABBC) as one of the country councils of the BRICS Business Council
- The SABBC is a significant parallel stream to the intergovernmental process, initiated to focus on business-to-business engagements in the interests of creating tangible inter-trade and investment opportunities between the partner countries.
- A great deal of work has been done by the BRICS Business Council on both energy and skills areas and so they will be brought in as experts to assist with the process.





Energy Skills Roadmap Objectives

The project for Skills Roadmap to support a Just Energy Transition in South Africa is to develop an energy skills roadmap:

- Identifying new skills and competencies that will be needed in the energy sector in the future as a result of the energy transition
- The development of strategies to ensure that these are in place when they are needed
- Identification of those skills that will no longer be needed or will be needed at much lower levels in the future as a result of the energy transition
- The development of strategies that will reorient and reskill these groups of people.

The aim is to build on existing work, collate all the relevant information in one place and look longer term so that proactive measures can be taken

Phases of the Energy Skills Roadmap Project (1)

Phase 1: Set up and defining a detailed scope of work

- Set up a database of projects related to this initiative, conduct interviews and get stakeholder input into the scope and objectives and confirm the gaps. Finalise scope of work
- Set up an advisory committee of active stakeholders working in this area (including DPE, DMRE, DEFF, NPC, BUSA, NGO's researchers etc) to guide the work going forward and avoid duplication
- Develop a baseline dataset of current skills categories and training facilities. This work will be done by doing up-front research to gather available data and interviewing various experts in the field.
- Develop a list of experts and interested and affected parties that will be invited to co-create the energy skills roadmap by participating in the workshops and form a virtual network for on-going collaboration and information exchange.
- Partners will be sought to host and manage the database.

Phases of the Energy Skills Roadmap Project (2)

Phase 2: Developing the Energy Skills Roadmap

- A series of workshops with representatives from relevant bodies will be held to validate the baseline data from Phase 1 and identify gaps etc.
- It is possible that further workshops may be required to **reconcile** or normalise the data where there are large differences, or at least produce a range or benchmark and explain the differences.
- Four to five workshops that will use the baseline data to develop emerging jobs in the energy sector in South Africa will be held with interested and affected parties.
- Facilitators will build on the baseline study and will lead participants through the process to try and predict the future jobs in the sector. These workshops will generate new material and knowledge.
- A final workshop will then be held to develop a set of recommendations for business, government etc as well as to identify additional work that may be needed.
- A report will be written, edited and copy edited and published on the SANEA, BRICS and WITS/AELC websites.
- SANEA will set up a virtual “Impact Community” to provide a platform for exchange and further collaboration

Phases of the Energy Skills Roadmap Project (3)

Phase 3: Communication and Dissemination of Results

- Following the finalisation of the report SANEA, BRICS and AELC will publish the report on their websites
- The EWSETA will be approached to supplement their sector reports and NBI their economic pathways report
- Specific presentations will be made to relevant government departments e.g. DMRE, DEFF, DTI, DPE etc.
- A presentation and brochure will be developed and disseminated to the network (including the BRICS member countries) and advisory committee for further dissemination
- A series of co-hosted (SANEA, BRICS and AELC) events will be held to communicate the results and encourage further debate and to assist government and business with skills planning initiatives

Objectives for the day

What we want to cover



For us to playback the high level results



For you to review and reflect on the results – we are here to listen to you



Identify gaps



Insights for final report

What we will not be covering



To set the vision for the sector



To confirm the quantum of required occupations/skills for the sector – just reflect what is needed



To promote or criticise any of the studies or technologies



To select preferred technologies

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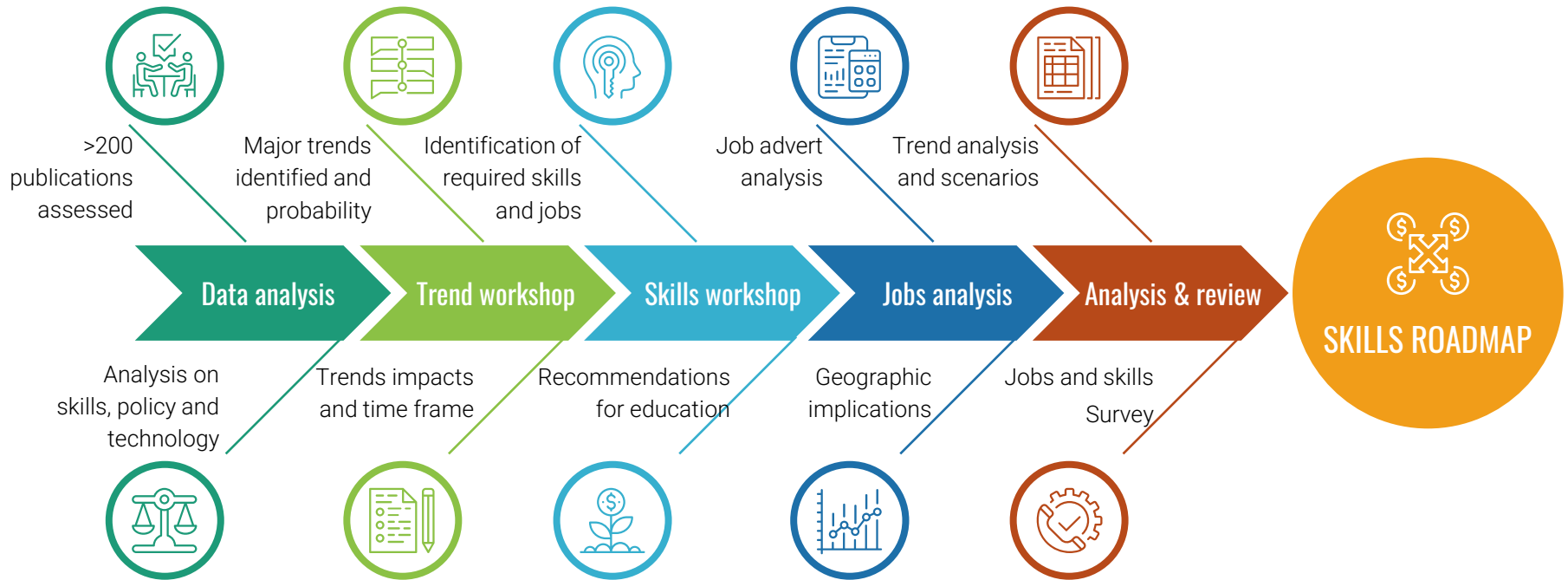
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Considerations

- In relation to trends not just techno-economic
- What is the journey that joins the start and end
- Scales of magnitude and timing
- Level of readiness – policy and actors in the system
- Is it just
- Risk and uncertainty

Process



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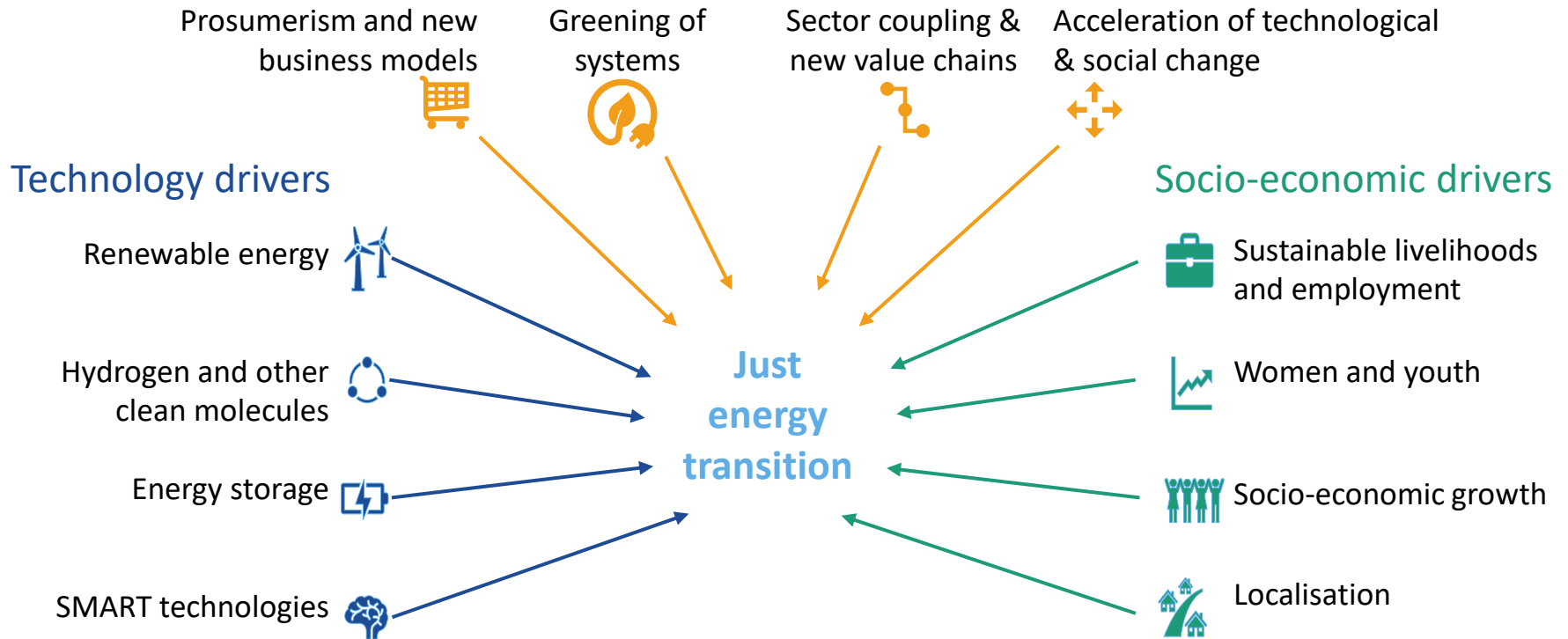
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Data analysis

System drivers

Global Meta-trends



Graphic representation

Drivers

Technology
Socio-economic
Global

Occupations and skills

Techno-economic
Not market driven
Not value chain based
Soft skills enablers but not
recognised

Policy

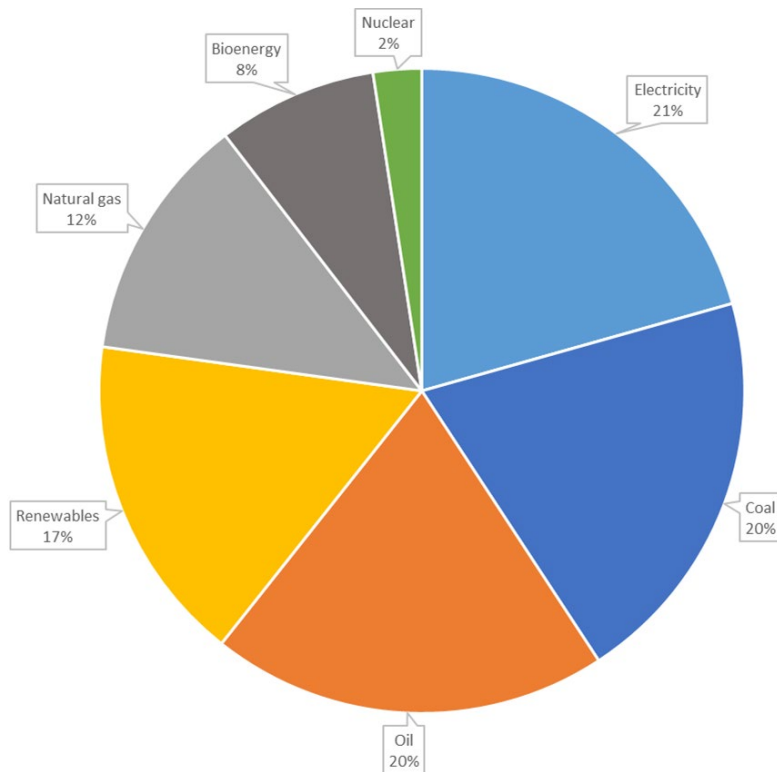
Integrated policy lacking
Energy vision not clear
Skills planning lacking
Social dimensions are included
but level of detail lacking



Trends

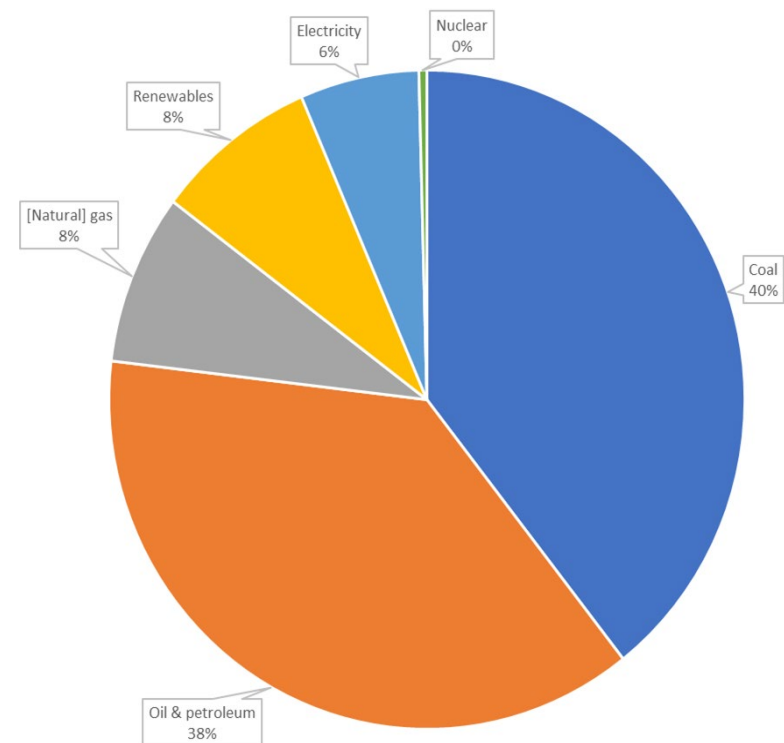
Energy sector labour market

Global employment profile, by sub-sector (2019)



Source: Derived from IEA (2022).

South Africa employment profile, by sub-sector



Sources: Derived from Rennkamp and Bhuyan (2017), DMRE (2022), Hako (2022), Hermanus (2022), IRENA and ILO (2021), Sapia, (2019), Skidmore (2021), Statista (2022), StatsSA (2022a)

Trends that emerged from the workshops

Overarching trend of ensuring transitions are equitable just and sustainable

The widening
energy cost gap

Deteriorating
energy security

Climate Change

Shifting towards
sector coupling

Evolving energy
markets

Automation and
digitalisation

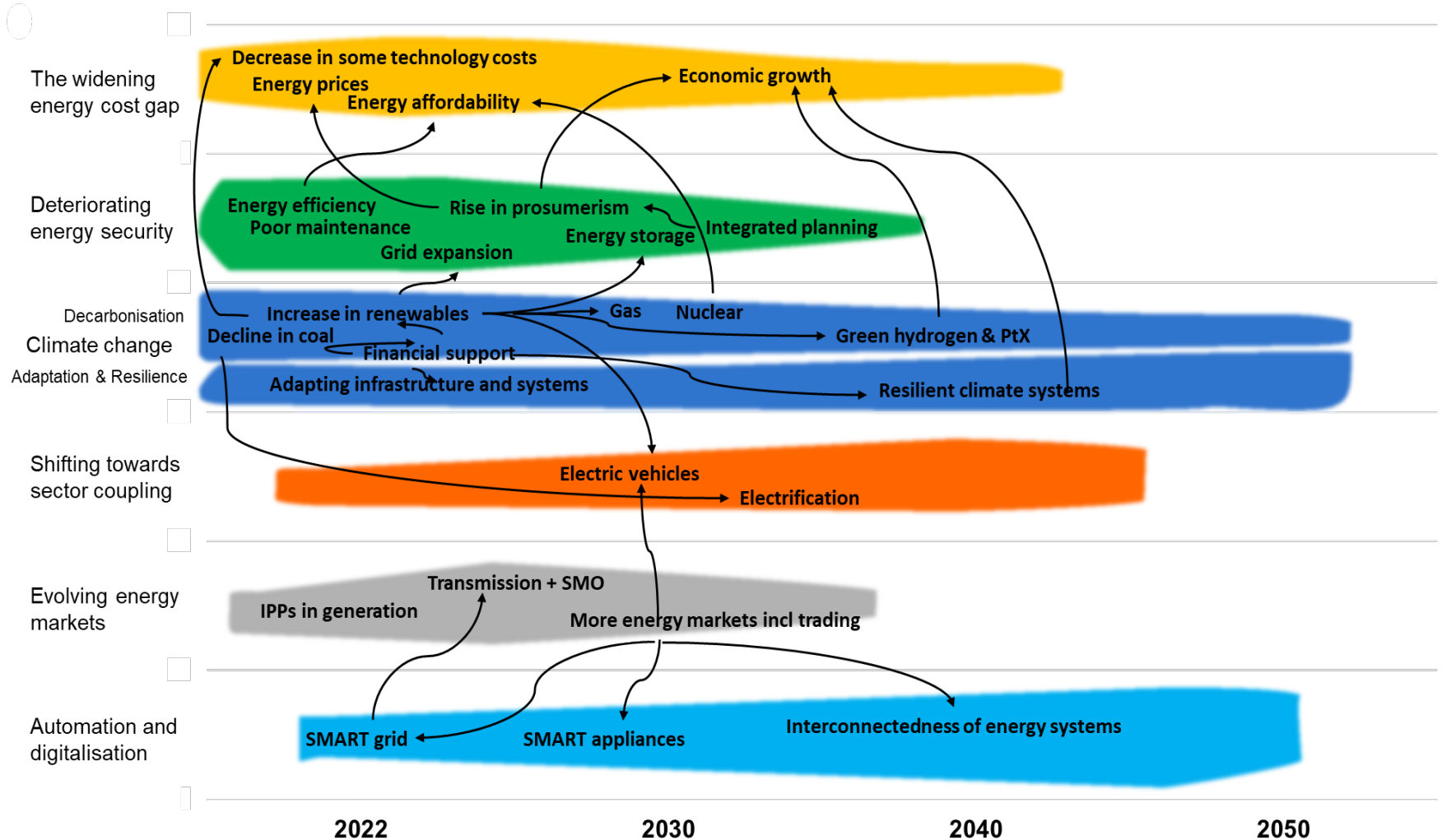
Achieving net
Zero by 2050

Resilient and
adaptable energy
systems

Trend: Climate change - achieving net zero by 2050

Definition	The Oxford Language definition of net zero is “ <i>target of completely negating the amount of greenhouse gases produced by human activity, to be achieved by reducing emissions and implementing methods of absorbing carbon dioxide from the atmosphere</i> ”.
Time Horizon	
Probability/rate of change	90% 60% 20%
What is it impacted by	Whether or not South Africa is able to reach net zero by 2050 is impacted by a number of factors including: •Energy consumption patterns •The degree to which energy efficiency and demand side management are implemented •The electricity mix (RE, storage, gas, nuclear, coal) •Green hydrogen and Power to X (PtX) production or importation •Financial support such as grants, concessional financing etc. •The degree of electrification of the economy •Economic growth
What it impacts	This trend has a wide ranging impact on the entire country and every sector, but particularly the energy sector. Some of the impacts include: •Cost of energy and thus the cost of doing business and energy affordability •South Africa’s competitiveness in global markets •The need for supporting infrastructure eg ports and pipelines
Actions or mitigation required	The actions required are identified in various policy documents, but many feel that what South Africa has committed to is not enough and is predicated on the support of developed countries, particularly funding and technology transfer: •Decisions on the pathway for a transition to cleaner fuels, including the role of gas as a transition fuel •This means updated Integrated Resource Plan (IRP) and Integrated Energy Plans (IEP) that are regularly updated every 2 years as a minimum. •Extension of the current IRP to 2050 and not just 2030 as it currently stands •Integration of government policy including incentives and taxes, trade issues, education, innovation systems and planning •National funding plan •Cost abatement curves

Consolidated trends



What the trends tell us

The complexity of the landscape

The inter-relatedness of the issues

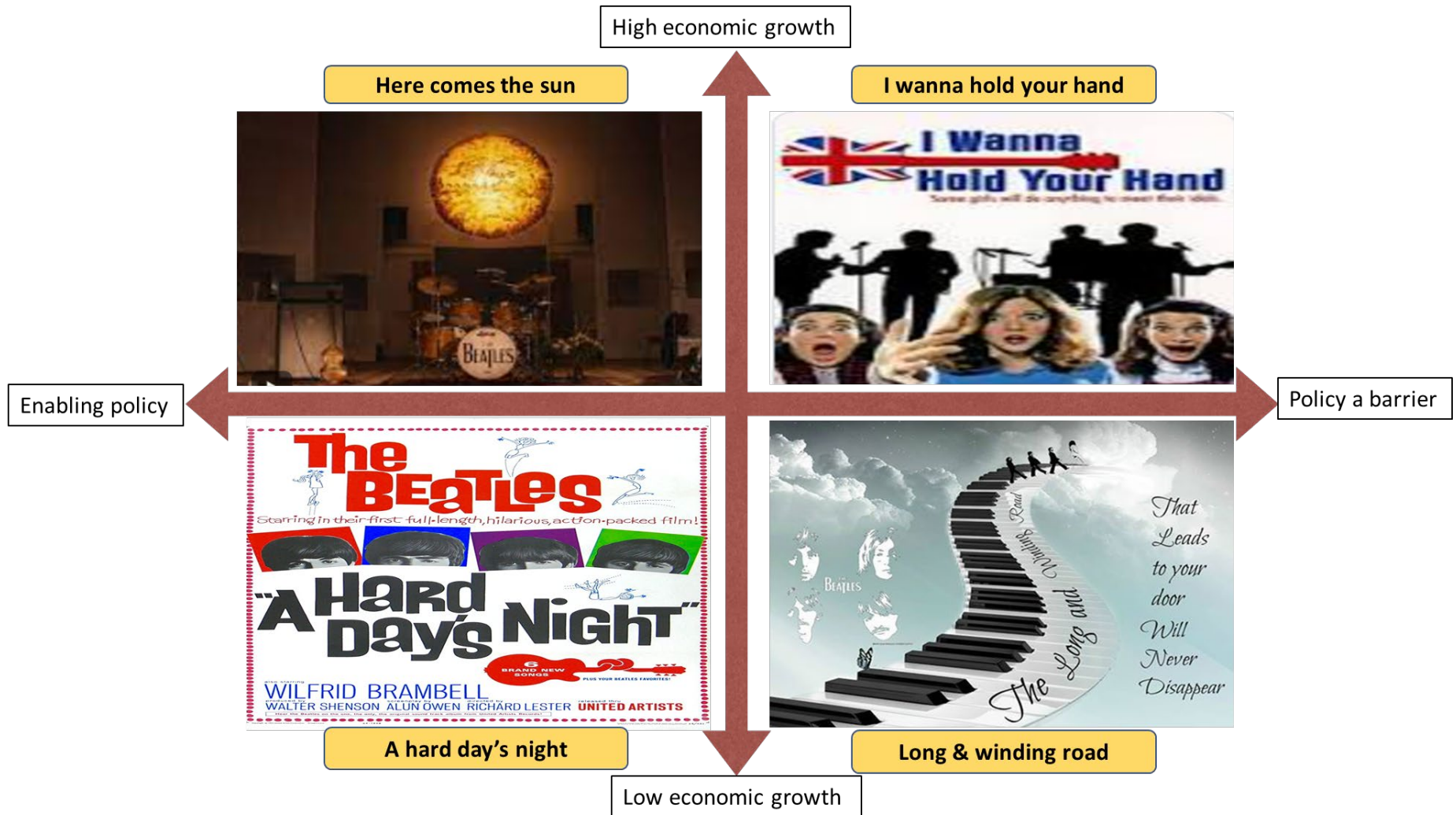
The central role of renewable energy

Where some key decisions will need to be taken that can change the energy sector fundamentally

The central role of energy security

Automation and digitalisation are also key drivers from a skills perspective as they will result in a decline in jobs over time

Energy scenarios



Here comes the sun

High economic growth

I wanna hold your hand

The country is growing at >5% GDP per annum and as a result the demand for energy is rapidly increasing. Government has reviewed and integrated policy to maximise investment in the energy sector by reducing red tape, putting in place one stop shops for bundled licencing and approvals and integrating policy across all relevant departments. Due to high levels of climate financing, Eskom coal plants are shut down early and replaced with renewable energy, storage and gas in the early part of the period as a transition fuel. Finished petroleum products are imported into the country. Sasol converts its plants to green hydrogen and PtX products over time and green hydrogen and PtX investment increases significantly. Investors bring in much needed investment and climate financing. Localisation increases and SMART systems, prosumerism and open markets are in place by 2050,

The country is growing fast but cannot keep up with energy demand as policy development and implementation are very slow. Investors have projects but cannot get licencing and other approvals in place. As a result, there is a huge growth in self generation and prosumers as they scramble to get energy to meet their growing demands. Some companies are moving their plants just across the border to take advantage of available power in the region. Given the policy uncertainty oil refineries close and finished petroleum products need to be imported putting pressure on port infrastructure. Gas investment does not happen due to policy uncertainty, but modular renewables do as they are not dependent on as many government approvals and can be put in place quickly. Eskom stays vertically integrated and so more wheeling takes place, cutting Eskom out of the picture. Green hydrogen begins but due to policy barriers does not reach its full potential.

Enabling policy

Policy a barrier

The country is experiencing very slow economic growth of 1% and government is putting in place enabling policy to try and stimulate the economy through investment in clean energy. The country has received extensive climate funding and is replacing its coal fleet with renewables, taking advantage of the slow growth to invest in the grid and SMART technologies. Self generation and prosumers is growing albeit slowly. Green hydrogen is being strongly promoted and barriers to investment taken away. Energy security improves due to the slow growth and replacement of the old, coal fleet, Net Zero is achieved by 2050. Eskom is split into 3 companies and new players enter the market which is well run and enables energy trading across the country. Eskom is however still experiencing financial difficulties as their revenues decline.

The country is in a major slump, GDP is less than 1% or negative and energy demand has fallen reducing revenue and seriously compromising the going concern status of SOE's. Government is slow to develop policy and implement it and does not consult widely, so policy is not business friendly, constraining economic growth and energy development. Investment has been hard to source, coal plants have had their lives extended and it is unlikely South Africa will meet its NDC commitments. Only a few IPPs have been added and Eskom remains vertically integrated, so an energy market has not developed despite several attempts to set it up inside Eskom. Energy security is a major problem with ongoing loadshedding and prosumerism has exploded with everyone making a plan to source their own energy. There is no money for investment in the grid, SMART or additional renewables for green hydrogen.

A hard day's night

Low economic growth

Long & winding road

Scenario key driving forces

Key driving force	Change			
	Here comes the sun	I wanna hold your hand	Long and winding road	A hard day's night
GDP	>5%	<3%	<1%	>1%
Ease of business	High	Low	Low	High
Energy security	Low to high	Low to very low	Low to extremely low	Low to medium
Net zero achieved	Yes	Maybe	No	Yes
Renewables	Strong growth	Strong growth	Medium growth	Medium growth
Gas	Strong growth	Low growth	Low growth	Low growth
Coal	Decline	Decline	Decline	Decline
Nuclear	Maybe	No	No	No
Energy efficiency	High	High	High	High
Green H₂ & PtX	High	Medium	Low	Low
Market	Many players, open	No movement	No movement	Some players
Prices	Moderate increases	High increases	Moderate increases	Moderate increases
Finance	Increasing	Increasing	Low	Medium
Prosumerism	Medium	High	High	Medium
Grid/SMART	Appropriate	Adequate	Insufficient	Insufficient
Localisation	High	Low	Low	Low
Just	Yes	Maybe	Maybe	Maybe

What the scenarios tell us

No regret options

- Renewable energy (and by association GRID and SMART)
- Energy efficiency (and by association SMART)
- Prosumerism (and by association renewables)
- Finance
- Energy security especially in the near term

Decisions will need to be taken

- Gas
- Nuclear
- Market
- Green hydrogen and PtX

Declining

- Coal

Finally there are skills required to make the transition just no matter what the scenario.

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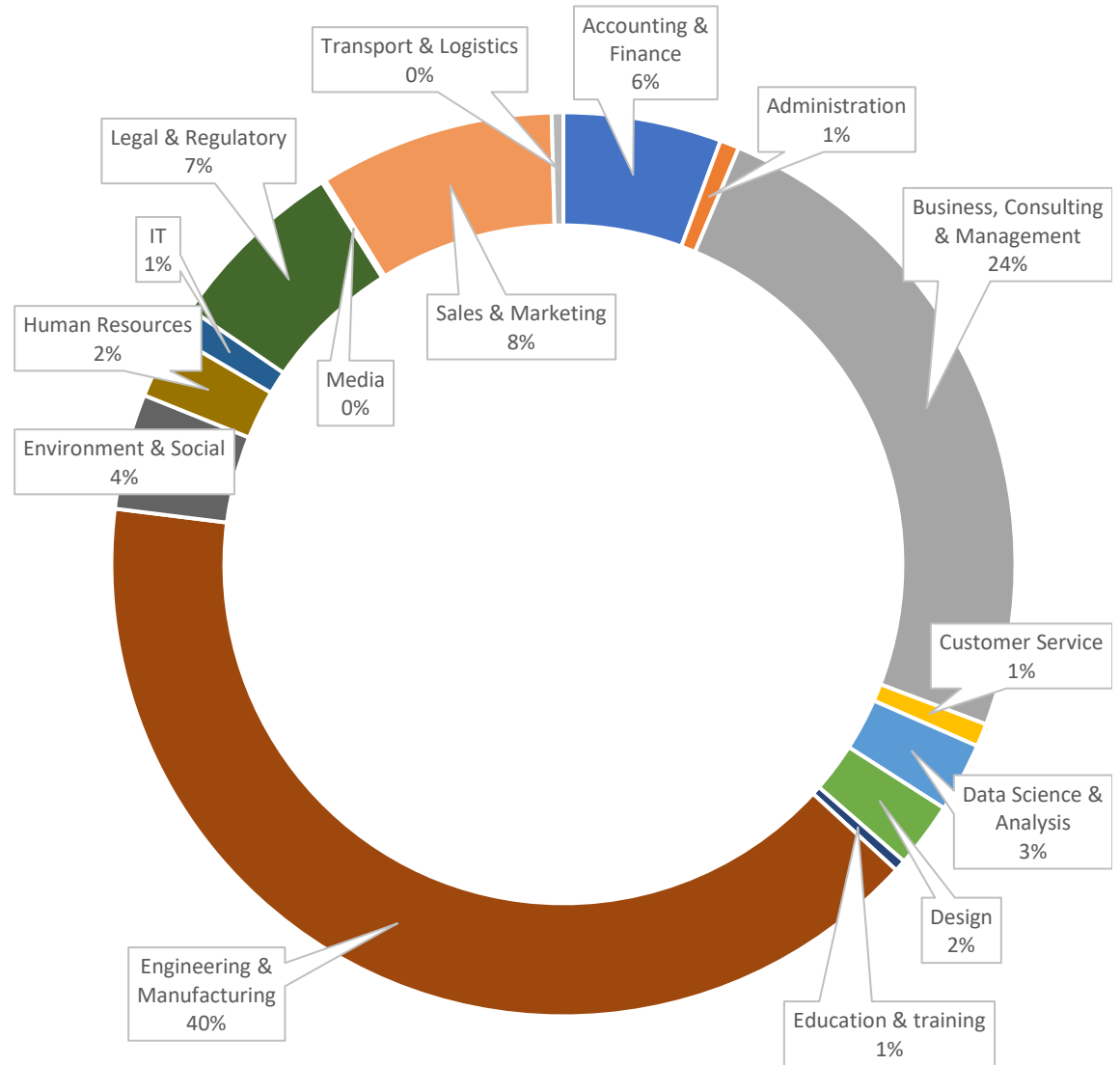
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Energy skills analysis

- Job demand analysis
- Trends implications on work
- Implications on skills



Job profile category



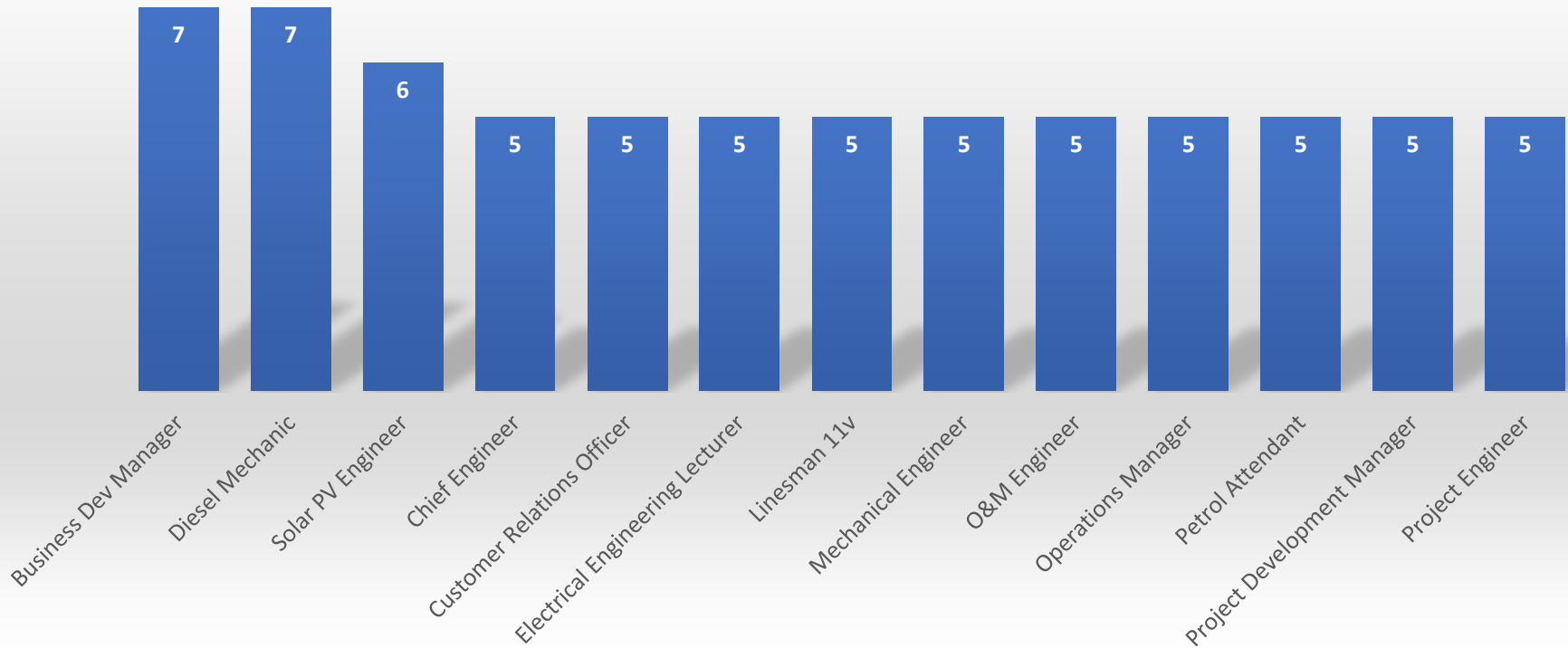
Job advert analysis: Main types of jobs (1)

Top 10 job titles



Job advert analysis: Main types of jobs (2)

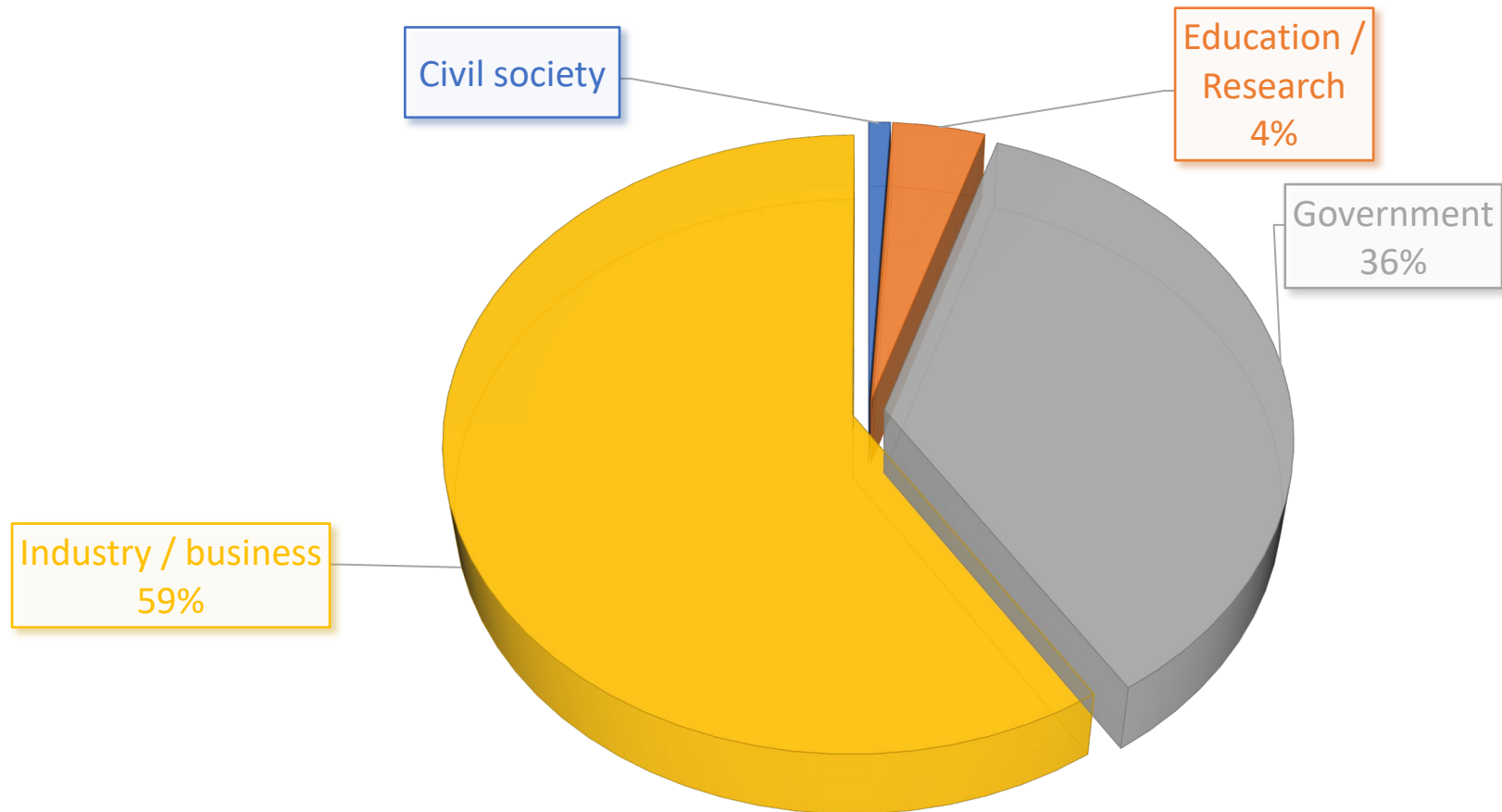
5 or more adverts



No of jobs with engineer in
the title

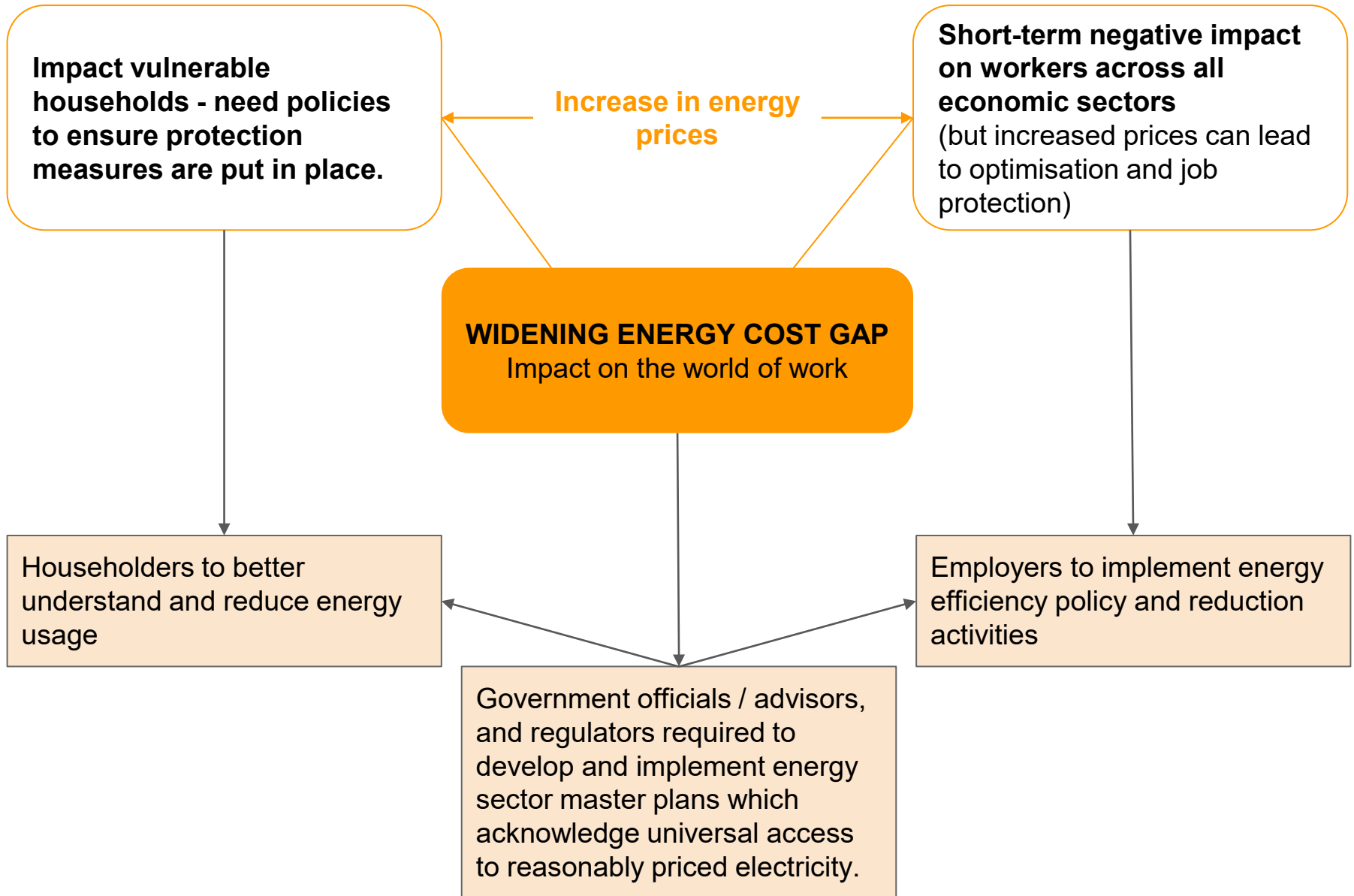
166 = 22,25%

Job advert analysis: By employer type

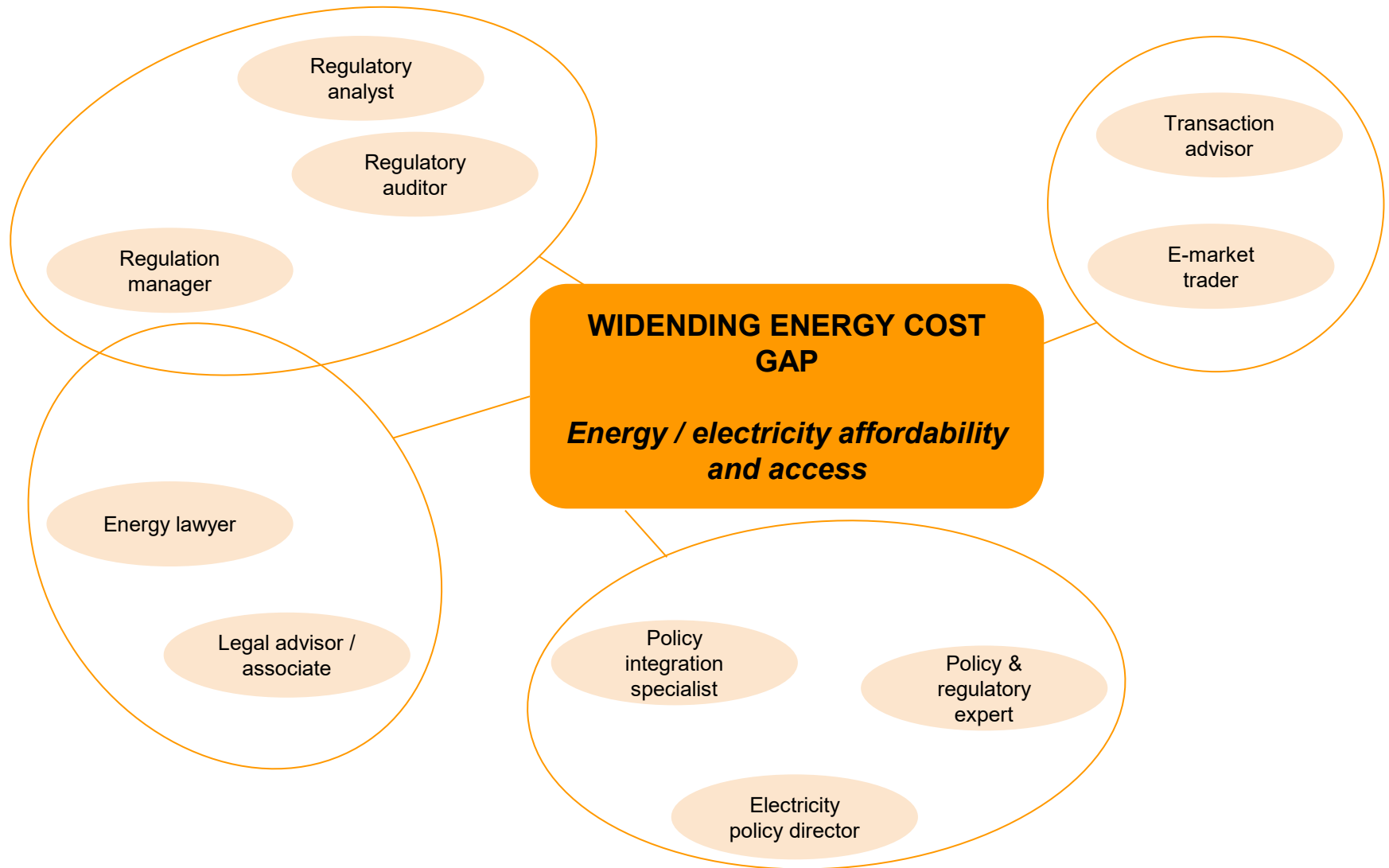


Job advert analysis: Level of skill

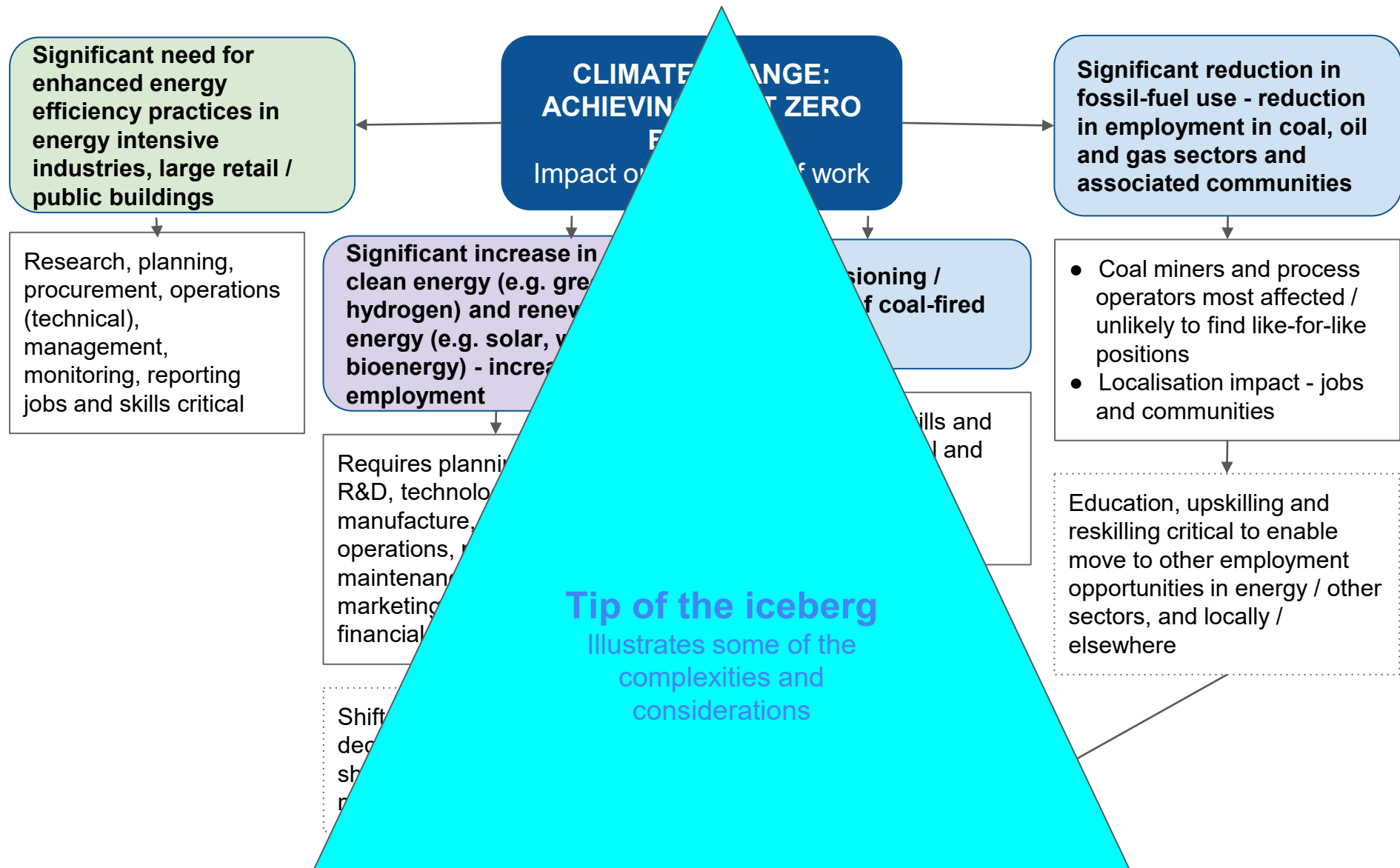
Implications of trends on jobs



Implications of trend on jobs: Job types required



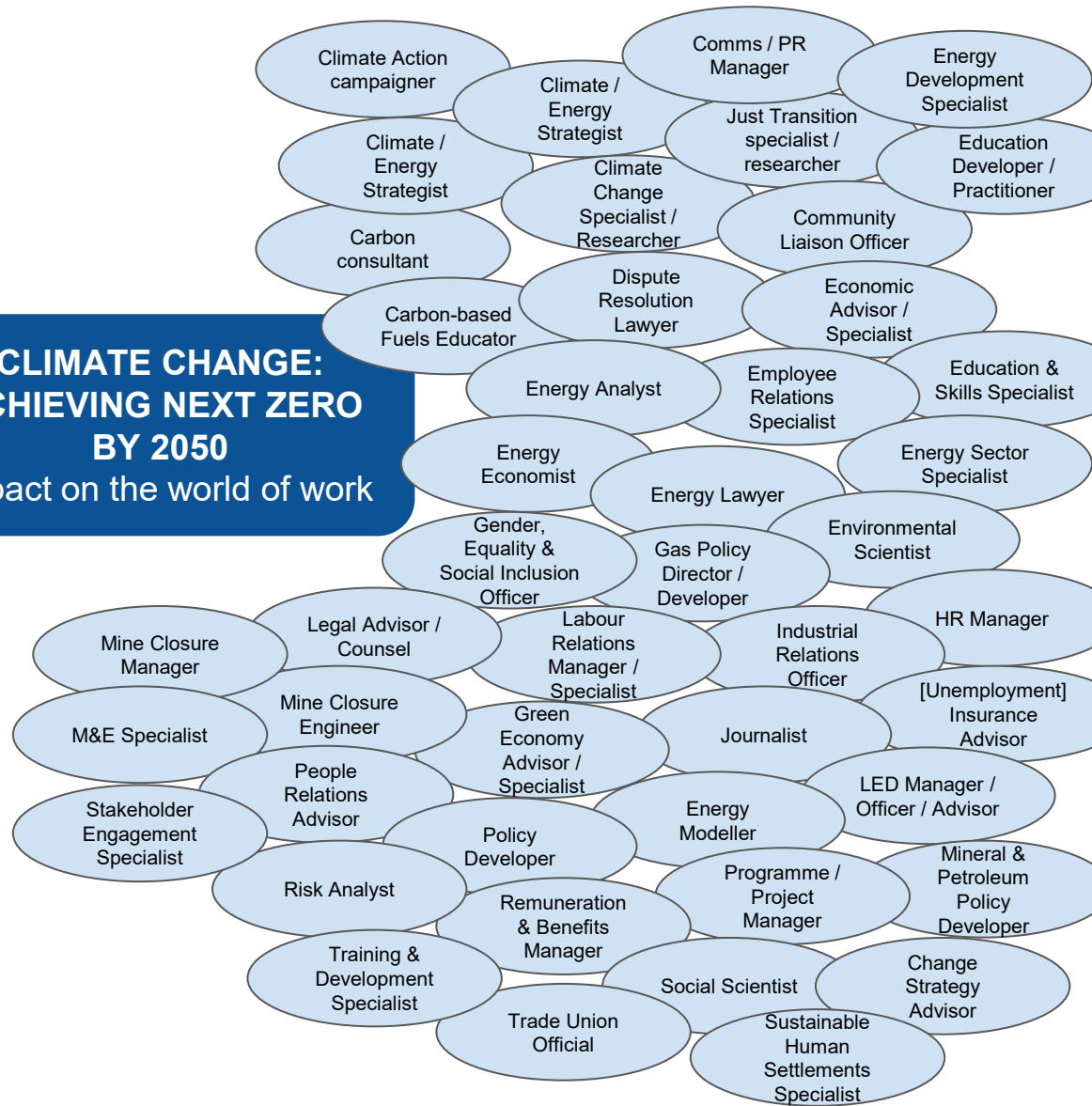
Implications of trend on jobs



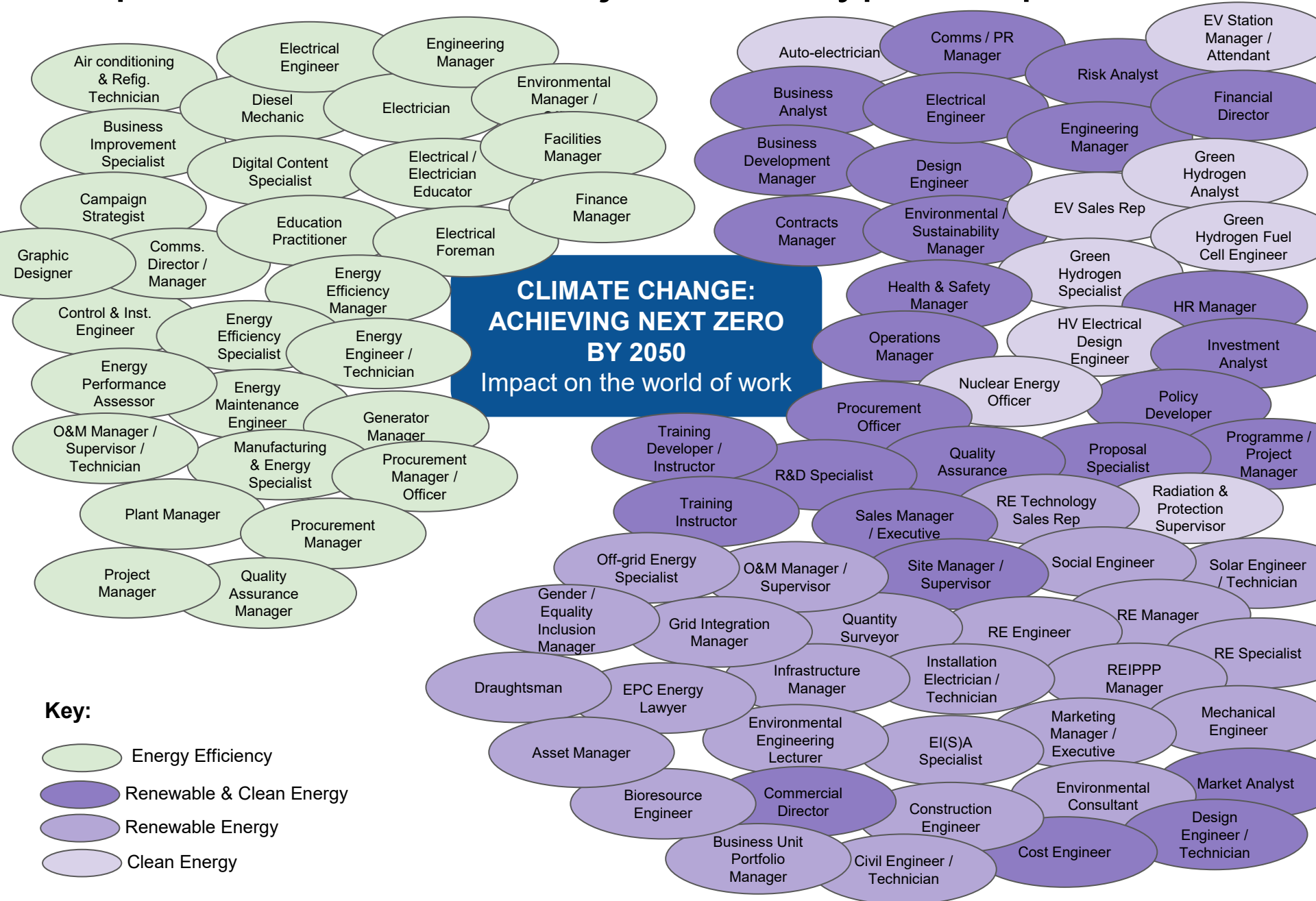
Implications of trend on jobs: Job types required



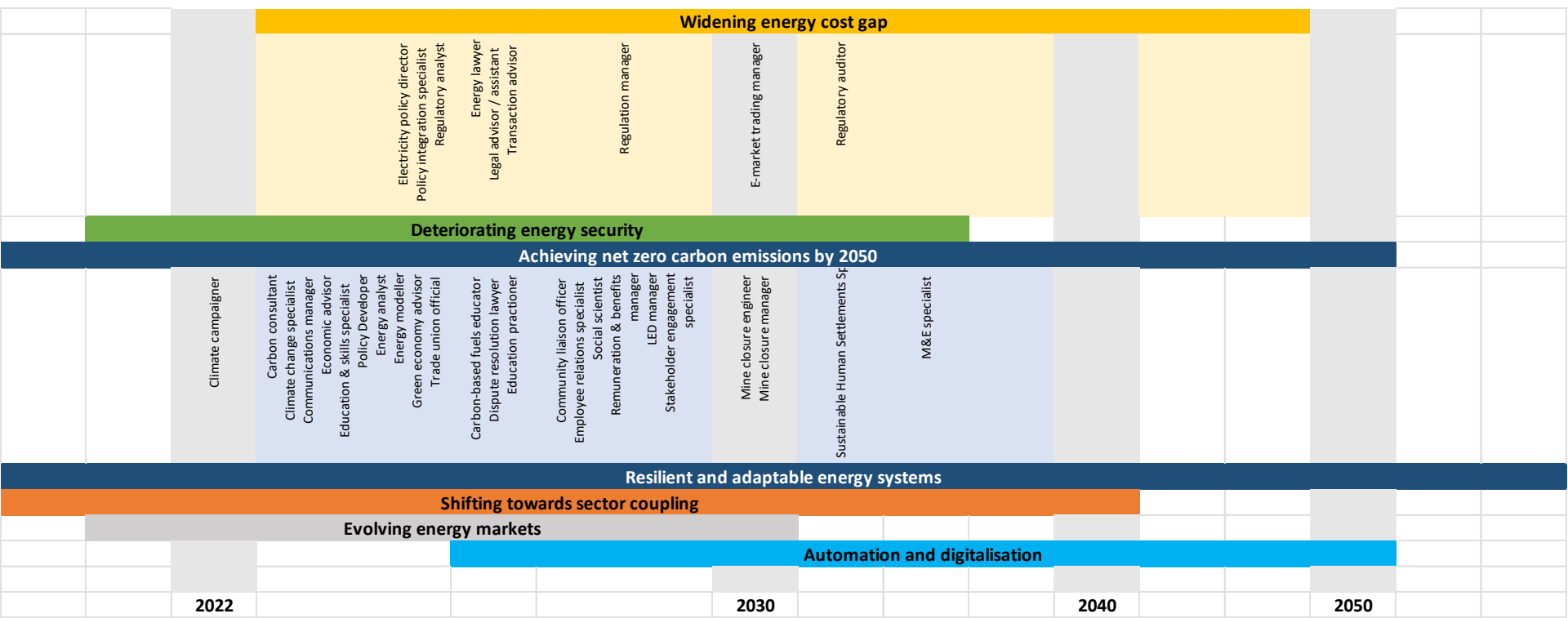
**CLIMATE CHANGE:
ACHIEVING NEXT ZERO
BY 2050**
Impact on the world of work



Implications of trend on jobs: Job types required



Jobs along time horizon



Implication on skills provisioning

CURRENT PROVISIONING

Public universities

- Offer electrical engineering degrees and diplomas
- Mining and other traditional engineering programmes
- Renewables (DUT, SARATEC @ CPUT)

TVET colleges

- Traditional electrical engineering, installation and infrastructure certificates
- Few placing emphasis on renewable energy or energy efficiency

Short courses

- A notable trend to meet employer demand (leadership through to installation)



REQUIRED PROVISIONING

Universities

- Need to provide specialisms e.g. renewables, storage, energy efficiency (explicit), systems / grid management, trading, clean energy e.g., green hydrogen and EV
- Need to be multi-disciplinary e.g. incorporating social sciences
- Focused research centres

TVET & community colleges

- Need to respond to location demand e.g. in coal communities (upskilling) or Northern Cape Solar PV training

SETAs and employers

- Enable work-based learning (learnerships) to gain experience
- Transferral of skills from international technologists and OEM suppliers

Preliminary recommendations

- Areas of focus along the horizon
- Further research
- Occupations/job atlas
- Employee workplace based survey/learning
- Pathways

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Next steps

- Do a survey to verify final dataset
- Complete report
- Launch end January 2023
- Disseminate



Thank you