

Brief response to

South Africa's Green Hydrogen Commercialisation Strategy

ACADEMY OF SCIENCE OF SOUTH AFRICA (ASSAf) FORUM
on the
JUST TRANSITION IN SOUTH AFRICA

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Eugene K Cairncross

Technical Advisor to the Life after Coal campaign



THE CONTEXT OF THIS DISCUSSION

1. **Climate Change** – the imperative to reduce GHG emissions as rapidly as possible, CO₂ emissions to zero or near zero, CH₄ by 50%, by 2050.
2. **South Africa's emissions intensity**: 436 million tCO₂; combustion of fossil fuels responsible for 98,8%; cement, steel, aviation, shipping: 6,7%.
3. **30 000 deaths per year** are due to the poor ambient and indoor air quality resulting from the combustion of fossil fuels and household solid fuels.
4. **50% of the population is energy poor**, those with no access to electricity or who can't afford full access. Increasing the cost worsens this situation.



THE JT CONTEXT OF THIS DISCUSSION

5. There is a **crisis in electrical energy supply**, resulting in loadshedding, interruptions of health and other services, small business closures, increasing unemployment and huge overall economic costs. There is also a crisis of affordability.
6. The **phase-out of fossil fuel industries**: coal-power, the manufacture of vehicles manufactured by traditional automakers and all related industries will impact jobs and the communities depending on these industries. (narrow definition of JT)
7. The **South African economy** is characterised by extreme inequality, widespread poverty, lack of economic opportunities, rising unemployment. (broad definition of JT)



WHAT SHOULD WE BE DOING?

- A) Address all of the above, prioritising actions that simultaneously and synergistically address 2 to 7, by building wind/solar/batteries/grid infrastructure and promoting economic development in the process.
- B) Social and economic justice demands that an appropriate level of investment be prioritised and directed at mitigating the impacts on workers and communities of the transition away from fossil fuels.
- C) Reshape the economy.



Does the ***Green Hydrogen Commercialisation Strategy*** respond to this context?

Which, if any of these boxes are ticked by the GHCS?



The Green Hydrogen for export

- Makes no contribution to SA decarbonisation, diverts financial and other resources from local investments
- Carries a huge financial risk – market uncertainty

To quote Eight Challenges (GHCS report):

- “2. Green H2 Supply-demand mismatch blocks offtake,
- All projects in IDC-KfW radar have no offtake agreements
 - Offtakers don't want to lock-in prices long term since price will go down
 - ***Market unclear on whether green or blue hydrogen will dominate market***”



Green Hydrogen – Financial Risks

“The target of 3.8 mtp [of GH] by 2040 will require total investment of \$164 bn by 2040.’ [about R3 trillion]

‘Government subsidies and incentives will be required ... that aids GH2 price parity *to increase domestic GH2 demand.*

Will an export price subsidy also be required? How much? ‘

[financing] “Assumptions:

- a)Debt to equity ratio 70:30
- b)DFIs contribute 30% of total equity requirement
- c)DFIs contribute 30% of total debt required”

These ongoing subsidies are not costed.



GHCS – Unacknowledged Technology Risks

All the technologies in the GHCS have to compete with technologies that electrify energy across the board.

- GH has already lost the competition for road transport – there are millions of EVs, from bikes to passenger vehicles to buses and heavy duty trucks already on the road while HFCVs sales stagnate at a few tens of thousand. The ‘Hydrogen Corridor’ is a non-starter.
- ‘Sustainable fuels’, produced using GH via the Fisher-Tropsch process as substitutes for fossil petrol, diesel or aviation fuel, make no contribution to reducing GHG emissions
- Green ammonia and green steel, may perhaps happen, but even in these cases there are competing approaches and technologies.

