CAN
CLIMATE ACTION NETWORK
Tanzania

August 2022

# Policy Brief

## NOT AT ALL COST

THE COST OF STICKING TO FOSSIL FUELS IN TANZANIA

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Akintunde Akinleye / Climate Visuals Countdown

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Brot für die Welt

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### Key Messages:

- Transition to 100 % RE is cheaper for Tanzania than sticking to fossil fuels.[1]
- Transition to 100 % RE mitigate risks of fossil fuel
- Transition to 100 % RE mitigate annual 23.3.bnUSD of loss & damage globally & upto 240 mio USD in Tanzania every year. Preventing 12 656 of excess deaths every year.
- RE are the key to unlock affordable, reliable and sustainable energy for Tanzania.

### Recommendation:

- **Develop stand-alone Renewable energy strategy** : based on cost-effective scenarios for fossil fuel phase-out and transition to 100 %. RE ,including an action plan, M&E and establishment of focal points.
- **Develop planed just phase-out of fossil fuel production by 2042 :**Clear milestone for reduction of fossil fuel production has to be defined: 28 % by 2030, 69 % by 2035.

## Introduction

### Energy unlock Development

Energy unlocks livelihood options and is a core element of sustainable development. Ensuring access to affordable, reliable, sustainable, and modern energy is critical hence set as Sustainable Development Goal 7.

### Choose your way

### Navigating Pathway-dependences

Pathways towards attaining the goal of **energy access for all** are determined by the source used for power generation which is Renewable Energy (RE) or Fossil fuel based ( i.e. coal, fossil gas and other fuels). The pathway selected is of importance as energy investments are expensive and last for many years therefore cannot be changed readily. Furthermore the pathway is accompanied by infrastructures to support it such as grid infrastructure, pipelines and more, these infrastructure limit flexibility of changing pathways in future. There are several scenarios, visions and policies envisioning a pathway for Tanzania towards energy access for all. The national energy policy 2015 envision a pathway of mixed RE and fossil-based fuel with significant RE contribution. Current guiding plan of the energy sector (Powers System Masterplan 2020: PSMP 2020) pathways is fossil fuel dominated by increasing role of coal and fossil gas in the energy mix meanwhile not appropriately planning to increase the role of renewable energy. Most recent scenarios studies for Tanzanian energy futures show that a fast upscaling of renewable energy (RE) is more cost-effective than relying on fossil-fuel based pathway for enhanced energy access(IRENA 2021, Clean Energy Transition Tanzania 2022).[1] The use of RE is shown to be more cost effective at installation and operation with more affordable electricity and can effectively cater to the local challenge of energy access in rural areas.

***100 % RE Scenarios are cheaper for Tanzania than the fossil-fuel-based Power System***


[1]Costt of investment under Clean Energy Transition Tanzania (CETT) scenario (103.4 bn USD) compared to Power system Masterplan 2020 scenario ( 104,7 bn USD according to CETT-study 2022

# HIGH RISK—HIGH COST OF FOSSILS: A DANGEROUS DISTRACTION

## Comparison of Pathways: Fossil vs RE

Recent scenarios studies show that to meet National Energy demand by 2050, implementing the PSMP 2020 ( 104.7 billion USD by 2050) will be more expensive than a Clean Energy Transition Tanzania scenario (CETT, 103.5 billion USD by 2050 ) that reaches 100 RE % energy in 2050.

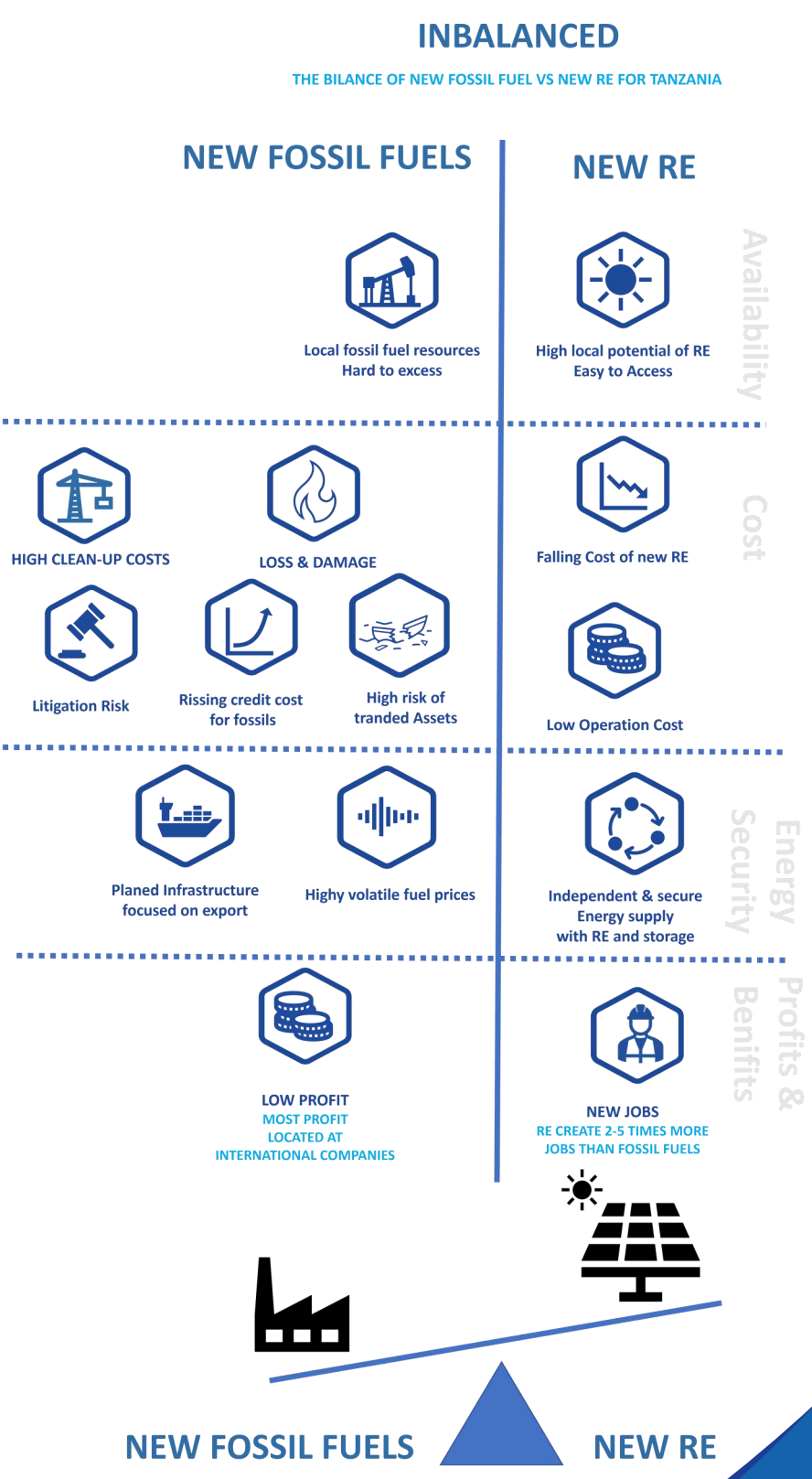
## Reviewing arguments of the PSMP 2020

The **arguments favouring fossil-based pathway** that increases the role of coal and natural gas as **portrayed in the PSMP 2020** and Tanzania Development plans are; (1) coal and natural gas are locally found in significant quantities and can be extracted at feasible costs (2) they can be used to produce electricity at an affordable cost (3) its energy generation capacity can be controlled to match demand (4) locally sourced hence not susceptible to international impacts (5) it's a big industry that offer multiple job opportunities, (7) other useful by-products are provided along with energy and lastly (6) development of technology for land reclamation and energy production enable reduction of carbon footprint (impact) of fossil fuels.

## Questioning Arguments for Fossils

The argument for fossil-based pathway has to be **critical reviewed**. In specific the main argument of affordable cost is challenged by recent scenario studies, that explore cost-effective pathways.

The use of fossil based fuel is like a quick sand entrapping victims slow with future difficulties to escape. The counter arguments promoting RE pathway as portrayed in CETT are as follows;

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# HIGH RISK—HIGH COST OF FOSSILS: A DANGEROUS DISTRACTION

## Falling cost of RE

The **falling cost for installation and operation of new RE plants** and rising cost of installation and operation of new fossil fuel-based power plants makes it more cost effective. Cost of RE is falling drastically due to high demand, ongoing innovation, low maintenance and operation cost (IRENA 2020, REN21, p.30). Worldwide renewable energies are the cheapest source for power generation. (IRENA2019, IEA 2020, LAZARD 2020)

## Energy security with RE vs Energy dependency with fossil fuels

RE **are independent from highly volatile imported fossil fuel prices** such as heavy fuel oil used in standby national generators, therefore RE **guarantee low cost and easy access**. The Ukraine-war showcase how vulnerable economies depend on fossil fuels are and how fossil fuel dependency impacts the economy and energy security. Most existing and planed fossil infrastructure in Tanzania is focused on export on gas and oil and while therefore not enhance access to energy.

The CETT scenario show that with sufficient installed capacity of RE (54.8 GW) combined with storage technology ( 8.5 GW) a secure and independent supply of Tanzania with 100 % RE is possible by 2050 and cheaper then a fossil -based pathway.( Clean Energy Transition Tanzania 2022)

## Rising cost of fossil fuel investments

Additional project **cost of new fossil fuel projects are constantly rising** because banks, fund, investors, and insurance companies increasingly divest from fossil fuels and exclude them from there portfolio. Fossil fuel project became substantial unbearable risk for the portfolio of investors and insurance companies. Due to this the **cost for credits and funding for new fossil fuel projects skyrocketing** because investors want to avoid potential stranded assets and insurance companies are not longer willing to take the risk to insure fossil projects. (Banking on Climate Chaos 2022)

## Local Availability: Easy Access to RE, Hard Access to Fossil Fuels

Over half of the planned gas extraction projects in Tanzania would come from “ultra deepwater drilling” (Rystad Energy UCube January 2021) This is a extremely costly and risk process to extract gas. High operation and extraction cost make it less competitive on the global market. In a world which limit its carbon budget to stay below 1.5°C only few cheapest fossil fuel project will be able to supply the low demand which will be within the carbon budget. Production with high cost will end up as stranded assets. ( The Skys Limit Africa Report 2021). The IEA warned offshore gas production in Tanzania and Mozambique was at risk of “cost overruns which could significantly undermine the competitiveness of the projects (IEA, Africa Energy Outlook 2019). While the lack of gas infrastructure makes building new gas power generation facility costly and difficult to plan in contrast new renewable energies can be developed off-grid with a minimum need of supporting infrastrutucre. In comparison to gas a remarkable benefit of renewable energy is its well position to enhance energy access for rural areas with off-grid solutions (IRENA 2019).

## Lock-In into future cost an burden of clean-up costs

Fossil extraction sectors also **burdens the local society and future generation** with massive challenges of decommissioning, clean-up and close-down cost especially for **coal mining that cover hundreds of hectares and excavates the land**. The condition and cost of fair decommissioning and close-down are often not clearly and fairly shared. Often African countries are left alone with it while international cooperation benefit from most of the generated profits.

# WHO PAYS THE PRICE: LOSS & DAMAGE

## Externalized cost: Loss and damage

Loss and damage caused by climate change is increasing. The recent IPCC Impact report (IPCC 2022) show extreme climate event have been observed causing impacts on health, livelihood and well-being for impacted societies. The climate crisis is mainly caused by emissions from fossil fuels. A pathway for the energy sector relying heavily on fossil fuels have to factor in that this burden unproportionally high cost of loss and damage on its own society. The impacts caused by THG emission are not yet reflected in cost-scenarios of the energy system. A tonne $CO_2$e emitted in 2050 is estimated to cause loss and damage of 417 USD. globally and up to 4.19 USD in Tanzania alone.

The CETT scenario will have 0 $CO_2$-emission in 2050 per year while the implementation of the PSMP will contribute to climate crisis with 56 mt $CO_2$e.Therefore the implementation of the PSMP2020 would cause due to its emission in 2050 **annual loss and damage of 23.3 bn USD globally, up to 240 bn USD in Tanzania and 12656 excess deaths per year.**[1]

[1]Details see appendix Loss and Damage.

# FAIRE SHARE ? WHO PROFITS FROM NEW ENERGY ?

## Risk of stranded assets and litigation

Increasing climate impacts and experienced loss and damages coupled with evolution of legal mechanisms and attribution science of accountability is catalysing **climate change litigation** worldwide. Climate litigation doubled since 2015 (Setzer & Higham 2021).**Investors fear the financial and reputational risk of litigation** based on fossil fuels investment and starting to phase-out from fossil fuels towards RE investments. **Fossil fuel subsidy are also increasingly under pressure** and challenged worldwide by stakeholders. This contributes to the **cost for credits and funding for new fossil fuel projects skyrocketing**(Banking on Climate Chaos 2022).

## Tanzania does not profit from gas & oil

Current and planned fossil extraction and exploration projects in Tanzania, East Africa and Africa in general are designed to benefit investors and countries outside Africa. 66 % of the planned new fossil extraction and exploration projects and therefore expected profits are owned non-African international cooperation.(The Skys Limit Africa Report 2021) Most fossil extraction projects are owned by international companies as ExxonMobil,Shell, Ophir Energy and Pavilion Energy ( Fircroft 2020, Ecomonist 2020).
Current and planned pipeline and port infrastructure as the East African Crude Oil Pipeline (EACOP) or the planned LNG terminal in Tanzania have been designed to supply oversea markets rather than addressing energy poverty in Tanzania.(Rystad Energy UCube 2021) Additional Tanzania lacks existing gas infrastructure preventing local use and the local context (e.g. existing towns aren't properly planned etc) isn't favourable making it costly.

## More new Jobs in RE than for Fossil Fuels

Further more, only few high-paying and permanent jobs are located in the fossil fuel extraction sector that are hold mostly by foreign specialists meanwhile **RE create 2 to 5 times more jobs**. In specific in countries just entering the fossil extraction industry as Mozambique and Tanzania few jobs are held by local population(The Skys Limit Africa Report 2021).

## Exit fossil fuel production by 2042

## Milestones: Reduce by 69 % by 2035

To limit global warming with a high probability of 1.5 ° exploration of fossil fuels have to phase out fast including in developing countries. According to the Tyndall Centre, Tanzania must phase out fossil fuel production, reducing it by 28 % until 2030, by 69 % until 2035 and by 93 % until 2040 reaching net zero by 2042 to contribute to limiting global warming to 1.5 ° with a probability of 50 %. A just phase-out of fossil fuels exploration must be strategized and mainstreamed in Tanzania's Energy policies.

# Conclusion

## New RE are cheap and save—Fossil Fuels are more costly and risky

In sum all this cost-drivers of fossil fuels show that the cost of building and running new fossil-based power plants is increasing while cost of RE are keep falling. Benefits and profits of fossil fuels are more likely to be allocated at international companies and don't reach local communities. In contrast to this RE create locally more jobs . RE can unlock the access to save clean energies even with low local infrastructure due to saleable off-grid solution. For fossil gas Tanzania lack of infrastructure to supply rural areas and volatile fuel prices create risk and energy dependencies . Risk and cost of new fossil fuels threaten pathways of sustainable development in Tanzania while new RE can create save and affordable access to energy. By creating access to save and affordable energy new RE can unlock sustainable development.

# Recommendation

## Fast-Track RE and Just-Phase-out of Fossil Fuels

**Creating a enabling environment for RE** would unlock safe, cost-effective and fast pathways to affordable, reliable and sustainable energy access for all in Tanzania. A stand-alone energy policy and strategy can tap the high RE potential and guide Tanzania towards 100 % RE for all (CAN TZ 2022 a, CAN TZ 2022b, CAN TZ 2022 c). Detailed description of a recommended architecture of a RE strategy for Tanzania can be found in our Policy Brief on a RE stand-alone strategy.

A **planed phase-out of fossil fuel production by 2042** has to strategized and mainstreamed in Tanzania's Energy policies, Clear **milestone for reduction** of fossil fuel production has to be defined: **28 % by 2030, 69 % by 2035**.

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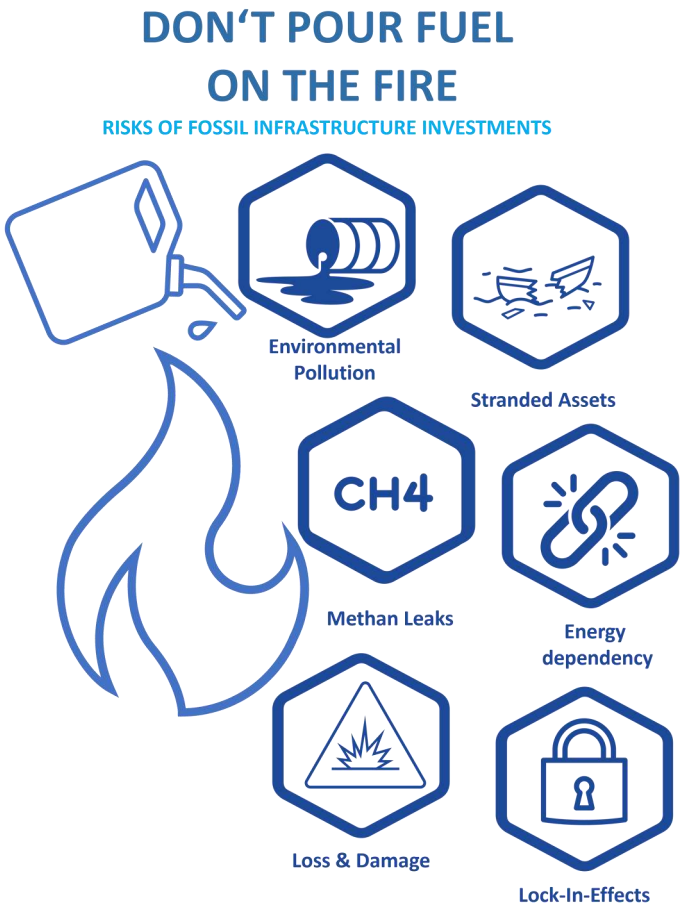
# APPENDIX: MITIGATE RISKS OF FOSSIL FUELLS

## Don't play with the fire: Fast-tracking RE to mitigate risk of fossil fuels

The Tanzania Power System Master Plan (TPSM 2020) plans an energy mix for 2044 with still 60 % coming from high greenhouse gas-emitting fossil fuels such as coal and fossil gas. Fossil gas specific natural gas is often framed as a necessary bridging technology that must be upscaled in developing countries to secure development. Contrary to this, the dependence on such technology is like a quicksand pit that slowly hinders national development. Fossil fuel impact all Social Development Goals (SDGs) negatively and threaten the realization of SDGs significant. (Ref: Fuelling Failure Report 2022). Fossil fuels are a dangerous distraction from the necessary energy transition in developing countries as discussed below:




- **Lock-In effects:** Promoting and planning fossil fuels leads to lock-in effects and stranded assets. Fossil fuel infrastructure requires remarkably high investment and needs long-lifetime of over 30 years to generate a return on investment. The investments incurred prevents transition to other better alternatives due to cost implications. This causes lock-in effects and development path-dependencies thereby hindering transition and significant financial losses as result. Specific large fossil flagship projects of the five-year development plan as the LNG (Liquefied Natural Gas) Gas plant in Lindi ($30 Billion), the Eyasi Wember Petroleum Exploration Project ($ 2 Billion) and the Mnazi Bay North Petroleum Exploration project need critical review.
- **Energy dependency:** The highly volatile prices of fossil fuels are a risk to energy security threatening sustainable development. High exposure of the energy generation to the highly volatile market risks can cause energy insecurity for consumers in the case of soaring prices. This can be triggered by unpredictable events such as the Ukraine-Russia war that has led to a significant cost increase from May 2022, with the expectation to last a full year.
- **Loss and damage:** Loss and damage caused by climate change is increasing (e.g. impacts from extrem weather). The climate crisis is mainly caused by emissions from fossil fuels. A emitted tonne $CO_2e$ estimated to cause loss and damage of 417 USD globaly and up to 2.7 $ in Tanzania alone. Therefore the implementation of the PSMP2020 would cause due to its emission in 2050 (56 mt CO2e) **annual loss and damage of 23.3 billion USD globaly and upto 240 million USD in Tanzania alone.**[1] The emission of implementing the PSMP 2020 would **cause 12656 deaths every year** in 2050.[2]
- **Environmental pollution:** Substantial risk of environmental pollution with serious impact on health and safety of people and environment if not effectively managed. Fossil fuels require expensive and complex sound management as the recently updated National Environmental Policy 2021 (NEP2021) of Tanzania. The NEP (National Environment Policy) 2021 is rising concern about several challenges in the sound management of oil and gas assets in Tanzania as "inadequate capacity on the management of pollution (…) compliance, and enforcement".
- **Stranded assets:** The risk of fossil fuel project to become stranded assets exposes the government to potential high losses when their budget is highly dependent on income generated by investment in fossil Infrastructure. The Climate Policy initiative predicts that the oil reserve of Uganda can lose 56 % of its value under a global carbon transition scenario that limits global warming to well below two degrees Celsius. As the entire world is advocating for carbon transition and the project has a long lifetime to reach ROI, this puts at risk billions of dollars invested in this project and consecutive projects like the East African crude oil pipeline (EACOP) from Uganda to Tanzania.
- **Methane leakage**: Global Methane Assessment shows fossil gas is part of the problem, especially due to high methane emissions occurring along the value chain. According to the IPCC (Intergovernmental Panel on Climate Change), methane has a Global Warming Potential of 87 higher than CO2 in the first 20 years after emission. Therefore, methane emissions cause a high short-term greenhouse effect and warming, which is threatening to trigger tipping points in the global climate system, leading to uncontrolled warming that will threaten human existence.

[1] Country-level social cost of carbon based on **Ricke et al. 2018**, are 4,29 $ per tCO2e at SSP3/RCP85-scenario,growth-adjusted with BHM RP SR damage model.( **Accessed via Data Explorer** 15.08.2022).

[2] excess deaths per t CO2e: 2.26 x $10^{-4}$ , **Bressler 2021.**

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