

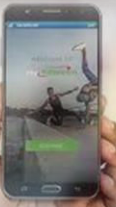
DEVELOPMENT OPPORTUNITIES WITH 100% SAF FUELING

Joy Nzue, Technical Advisor, GIZ



M-PESA

INTRODUCING
my Safaricom App

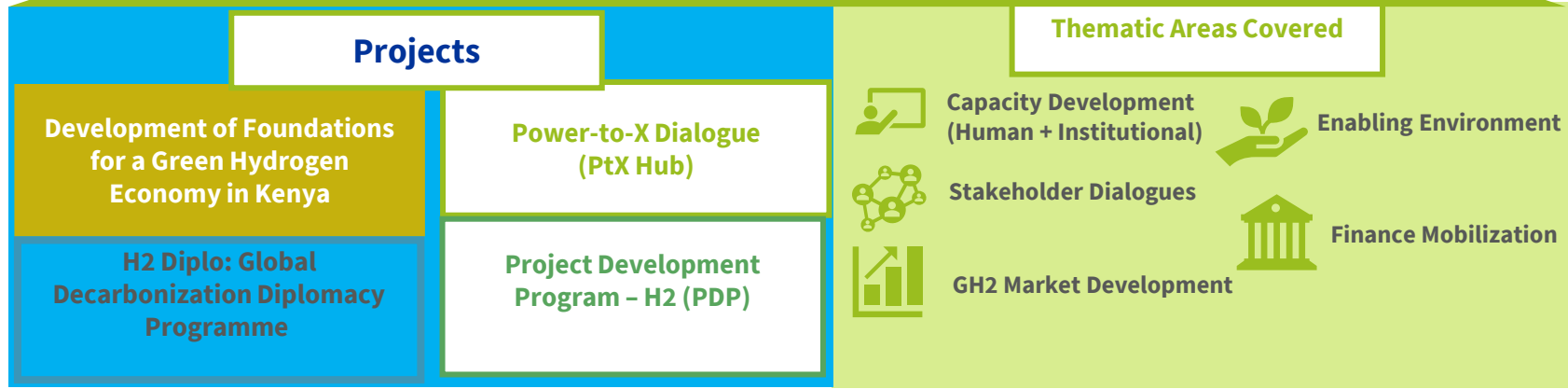


EQUITY



Green Hydrogen GIZ Project Portfolio

Green Hydrogen Strategy and Roadmap Implementation



EUR 8.13 Mio



Bilateral Projects Global Projects



Kenya's Green Hydrogen Journey



Supported by
on the basis of a decision
by the German Bundestag

TCCW 06.11.2024

Started in 2020 with the establishment of the Green Hydrogen Working Group by MoEP and co-chaired by Development Partners



GIZ Supported the development of Baseline Study on the Potential for Power-to-X/Green Hydrogen in Kenya

Through EU support Kenya Government through MoEP develop Kenya's Green Hydrogen Strategy and Roadmap launched during the Africa Climate Summit in September 2023

EPRA has developed Green Hydrogen and its derivatives guidelines



Kenya's Green Hydrogen Strategy and Roadmap

IMPLEMENTATION PLAN PHASE 1 (2023-2027); PHASE 2 (2028-2032)

Prioritise no-regret options to kickstart a hydrogen industry, such as domestic fertiliser production. Once successfully established, this will enable hydrogen opportunities in other sectors, including regional and international export.

TARGETS

2023 - 2027

Domestic market development

- Develop policy and regulatory instruments
- First commercial-scale green hydrogen project(s) operational
 - 20% of imported nitrogen fertilisers produced locally (= 100,000 tonnes)
 - 100% import substitution of methanol (> 5,000 tonnes/year)
- Establish cooperations with international RTD centres



≈ 150 MW new dedicated renewable capacity for green hydrogen



≈ 100 MW of electrolyzer capacity installed

2028 - 2032

Domestic market growth By 2030

- 50% import substitution of nitrogen fertilisers (300,000 - 400,000 tonnes/year)
- Pilot projects in other sectors, incl. baseload power and transport
- Production of green shipping fuels
- Explore regional export opportunities for green fertilisers



≈ 350-450 MW additional renewable capacity for green hydrogen



≈ 150-250 MW electrolyzer capacity installed

At least 1 billion USD direct investments
At least 25,000 direct created
At least 250,000 tonnes CO₂ avoided per year

2032 and beyond

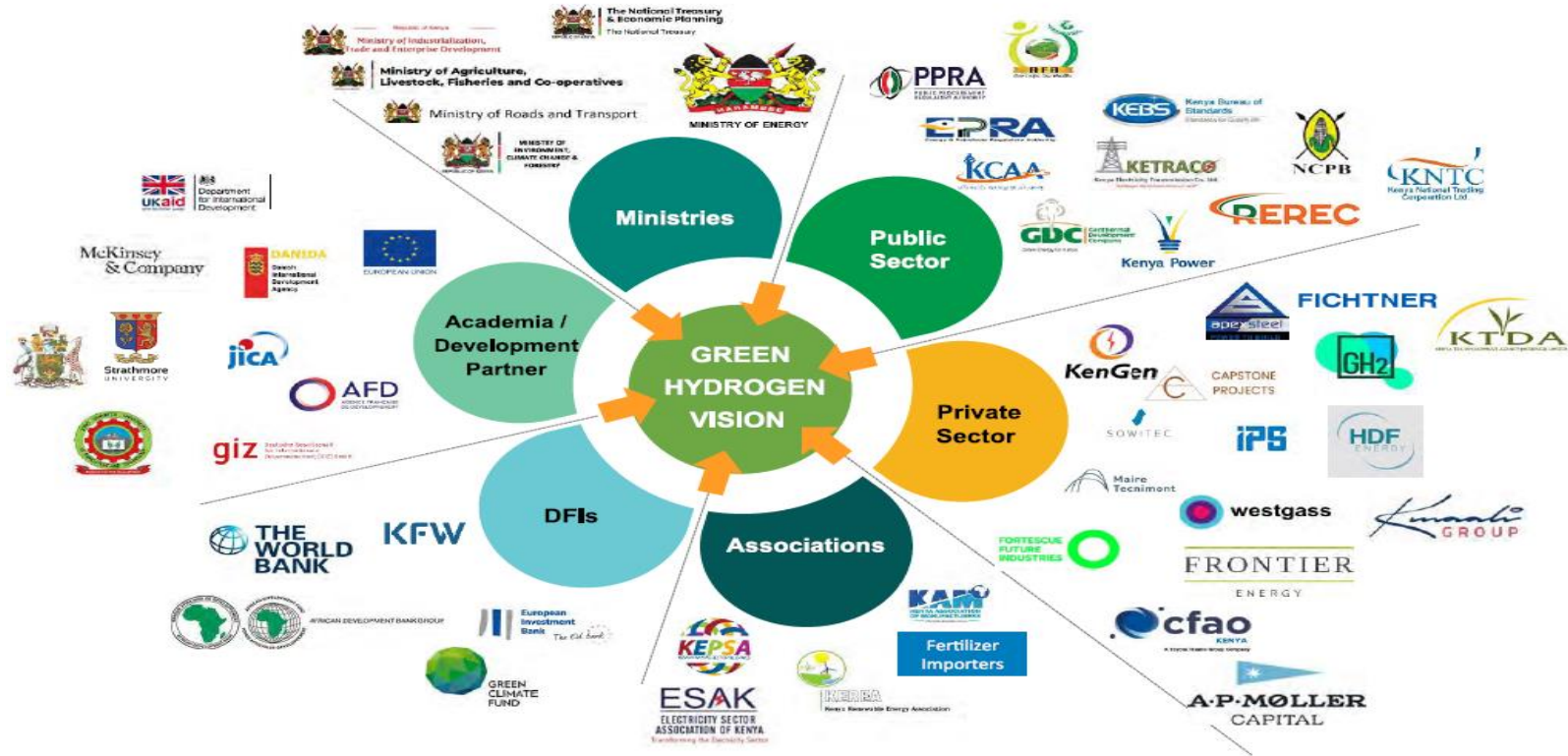
Domestic and export market growth

- Roll-out further green hydrogen applications, like transport or green steel
- Expand existing and explore new export opportunities for green hydrogen products "Made in Kenya"



Stakeholder Landscape

on the basis of a decision





International PtX Hub

Centre of **EXPERTISE** and **COLLABORATION**

With strong international networks for a sustainable market development

Supported by:



Federal Ministry for Economic Affairs and Climate Action

on the basis of a decision by the German Bundestag

IKI
INTERNATIONAL CLIMATE INITIATIVE



Implemented by

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Political & regulatory framework	<p>Supporting an enabling developing an enabling environment for PtX projects; Supported Energy and Petroleum Regulatory Authority (EPRA) in developing guidelines for green hydrogen and its derivatives. Offered technical support in development of Kenya's GH2 strategy and roadmap. Supporting aviation sector in coordinating a taskforce for acceleration and adoption of Sustainable Aviation Fuels (SAF)</p>
Development of Business Cases	<p>Supporting development of business cases; Aviation: Supporting development of prefeasibility studies for Power/Biogas-to-Liquid (P/BtL) pathway that will result to a tender for the same to be launched by Kenya Shipping: Supporting the development of a prefeasibility study on green shipping and green shipping corridor opportunities for Kenya Flower power: Supporting a baseline study for opportunities for greening the whole value chain of flowers from farm to market and areas PtX could play a role Research and Innovation Park: Supporting development of a prefeasibility study for a PtX research and innovation park to be located at KenGen's industrial park. KenGen is uniquely placed with resources such as electricity, geothermal steam and could also produce green hydrogen for potential innovators and startups.</p>
Capacity Development & Stakeholder Engagement	<p>Supported the development of Capacity Needs Assessment and Human Capacity Development Strategy for Kenya for PtX, carrying out basic renewable PtX Trainings, carrying out aviation and shipping deep dive trainings. Carrying out stakeholder engagements on topics such as aviation, shipping and finance. Supporting study tours to Germany for stakeholders for knowledge exchange</p>
Relevant Stakeholders	<p>Ministry of Energy and Petroleum, Ministry of Roads and Transport, Mining, Blue Economy and Maritime affairs, Energy and Petroleum Regulatory Authority, KenGen, Kenya Maritime Authority, Kenya Ports Authority, Kenya Flower Council, Kenya Civil Aviation Authority, Kenya Airways</p>
International Institutions	<p>EU, EIB, KfW, IMO, ICAO</p>



SUSTAINABLE AVIATION FUEL

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Activities for Kenya's Aviation Sector



- **Advanced PtX trainings** in Kenya for the aviation sector that provides a deep dive on PtL. One Aviation training already carried out in Q3 2023



- **Pre-feasibility studies** for techno-economic viability of Kenya becoming a PtL hub. This be used to establish a business case for PtL in Kenya and support development of first PtL projects in Kenya



- Support development of draft **policies and strategies** for SAF in Kenya. KCAA has formed a National Steering Committee for acceleration of SAF Development and PtX Hub is supporting its activities. Supports Technical Working groups in developing the policies and strategies



- **Networking opportunities** for aviation stakeholders to promote regional/ international partnerships. PtX Hub has co-hosted two SAF workshops with KCAA



Source: Kenya Airways

Current PtX Activities in Kenya

One green ammonia plant operational

Development of a 2GW plant for SAF production

One entity at the detailed feasibility study

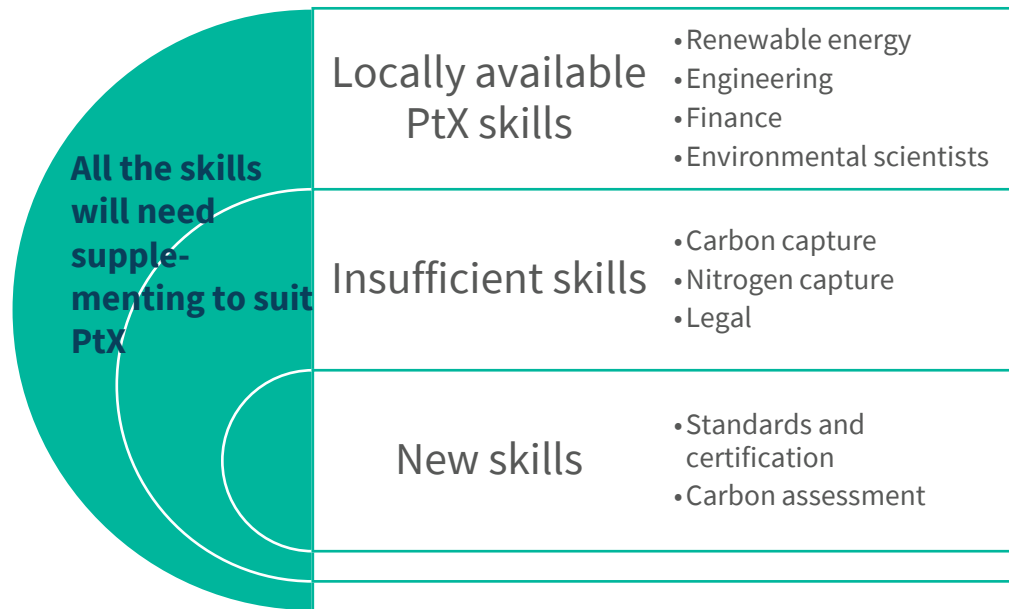
Resource identification (energy, land, finances)

Business case assessment and financial modelling

Identifying potential off-takers

Support enabling environment for development of SAF in Kenya





State of Locally Available Skills for PtX



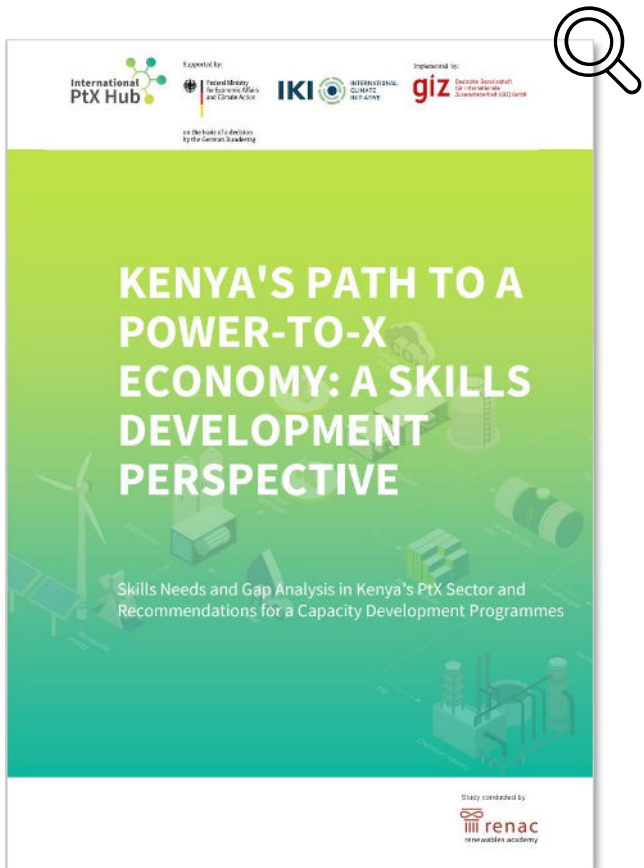
Jobs and skills for sustainable aviation fuels mapped along the project phases

“On average, a commercial-scale SAF production facility generates 2,210 jobs during the construction phase and sustains 1,440 ongoing jobs once operational.” (Rhodium Group, 2023)



 Planning & Design	 Transportation	 Construction & Installation	 Operation & Maintenance
<p>Perform planning, approvals and compliance processes Project developers, planners, regulators</p>	<p>Organising shipments of feedstocks and SAF products via maritime routes, if applicable Shipping coordinators</p>	<p>Designing and overseeing the construction of infrastructure, such as production facilities and storage tanks, installing and maintaining equipment used in SAF production Mechanical, civil engineers</p>	<p>Monitoring and controlling the SAF production process to ensure efficiency and quality Plant operators</p>
<p>Ensure compliance with safety and environmental regulations, permitting and other standards Regulators, inspectors</p>	<p>Coordinating the transportation of raw materials and products to and from the SAF production facility Logistics personnel</p>	<p>Wiring and installing electrical systems within production facilities Electricians</p>	<p>Conducting routine maintenance and repairs on equipment and machinery Maintenance technicians</p>
<p>Fabricating and welding metal structures and components Welders</p>	<p>Installing and connecting piping systems for the transportation of feedstocks and SAF products Pipefitters</p>	<p>Oversee green methanol plant construction and installation, supervising construction activities and ensuring adherence to safety and quality standards Construction manager</p>	<p>Calibrating and maintaining instrumentation systems used in SAF production Instrumentation technicians</p>
<p>Perform preliminary design and optimisation of the SAF production process Chemical and process engineers</p>	<p>Transporting feedstocks and finished SAF products between suppliers, production facilities, and distribution centres Quartermasters, Truck drivers</p>	<p>Installing and connecting piping systems for the transportation of feedstocks and SAF products Pipefitters</p>	<p>Testing SAF products for quality and purity to meet industry standards Quality control inspectors</p>
<p>Conducting inspections to ensure compliance with safety regulations during construction Safety inspectors</p>			<p>Implementing safety protocols and ensuring compliance with environmental regulations during operation Environmental, health and safety specialists</p>
		<p>Overseeing day-to-day operations, scheduling maintenance activities, and managing personnel Facility managers</p>	

Access the full study!





Source: Talus Renewables

2 MW Solar PV plant
with battery storage

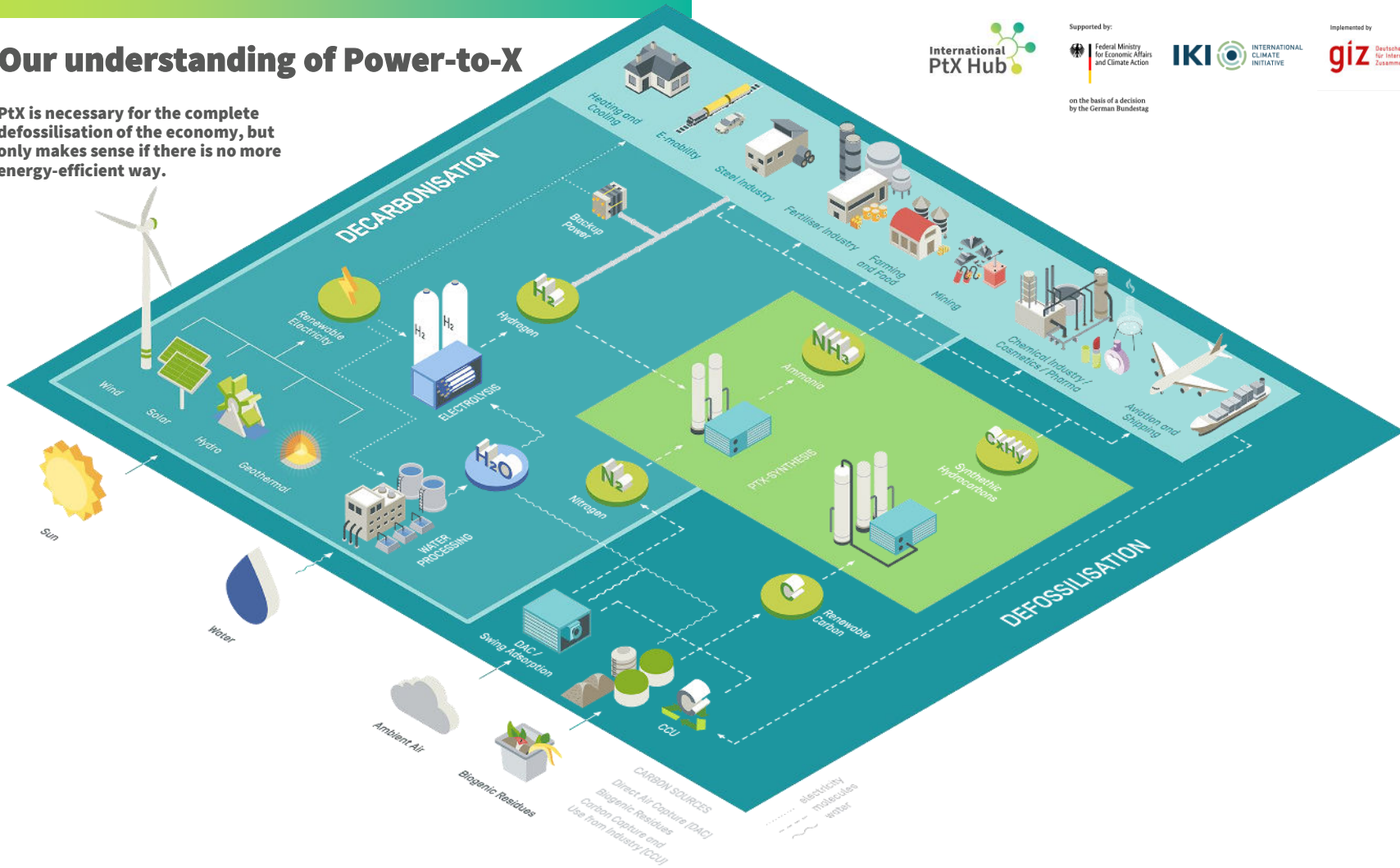
1.5 MW Alkaline
Electrolyser

1 ton/day ammonia
production

~ 1.4 Million USD
investment

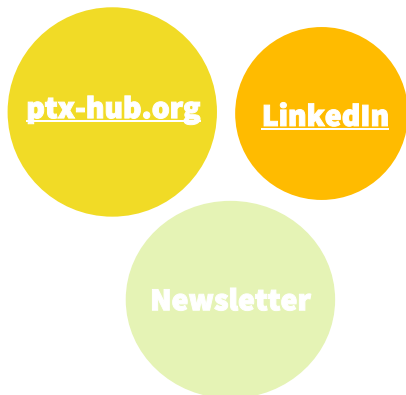
Our understanding of Power-to-X

PtX is necessary for the complete defossilisation of the economy, but only makes sense if there is no more energy-efficient way.



ASANTE

For further information please reach out
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 W H
Women in Green
Hydrogen

Expert Database - Women in Green Hydrogen
(women-in-green-hydrogen.net)

