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POTENTIAL ROLE OF  
HYDROGEN IN  
KENYAN AVIATION

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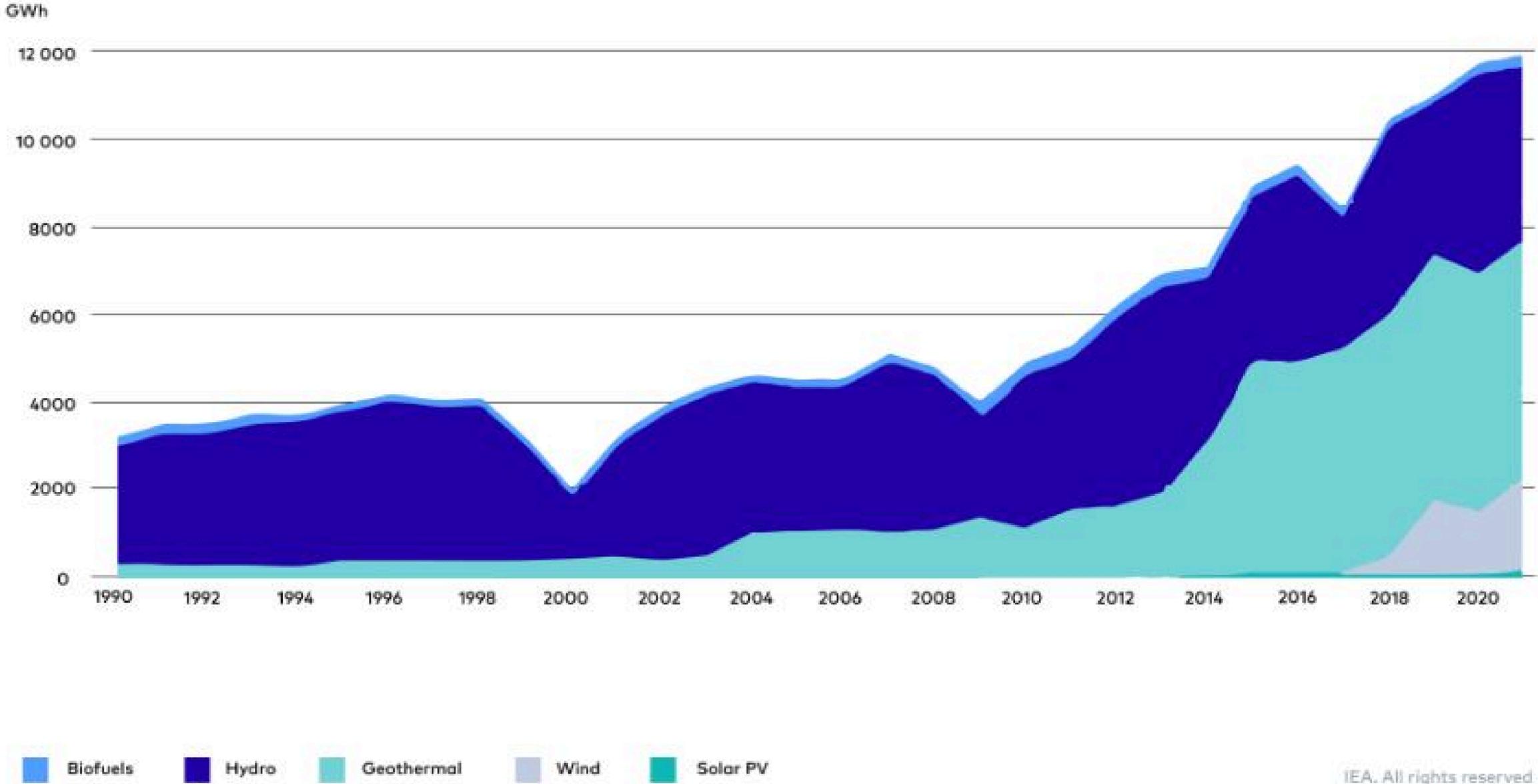
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In 2023, the KENYA ENERGY TRANSITION AND INVESTMENT PLAN (ETIP) laid out Kenya's Vision towards the attainment of Net Zero Carbon Commitment by 2050.

**Kenya has emerged as a beacon of renewable energy development in Africa**

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# Low-carbon electricity generation by source, Kenya 1990-2021



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# Assumptions

OBJECTIVE: Pilot Hydrogen Hub

STATUS:   

The pilot hydrogen hub shall produce green hydrogen

-  Hydrogen produced through renewable methods such as electrolysis with zero carbon electricity

The pilot green hydrogen hub shall have access to 100% renewable electricity.

-  The grid is approximately 88% Green which is more than enough to support early deployment

Stakeholder Engagement is critical

-  First green hydrogen symposium in Nairobi

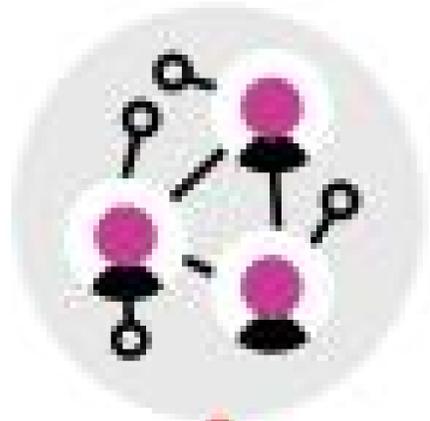
# SCENARIOS

<b>Sustainable Aviation Fuels (SAF) only</b>	<b>Optimistic</b>	<b>Conservative</b>
<ul style="list-style-type: none"><li>Hydrogen-fuelled aviation does not achieve any material penetration in the period to 2050.</li></ul>	<ul style="list-style-type: none"><li>Hydrogen-fuelled aircraft are introduced over the next 10-years</li></ul>	<ul style="list-style-type: none"><li>Hydrogen-fuelled aircraft are introduced five years later than the 10-year time frame.</li></ul>

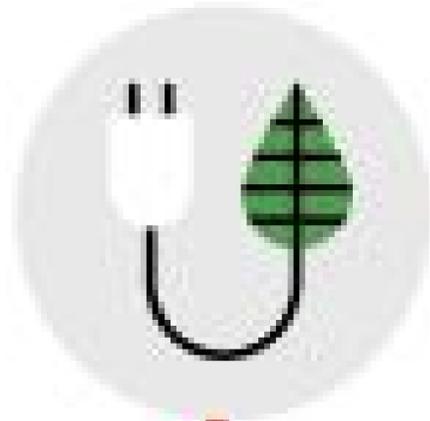
Business as usual - Kerosene remains the main jet fuel for aviation.

# Methodology

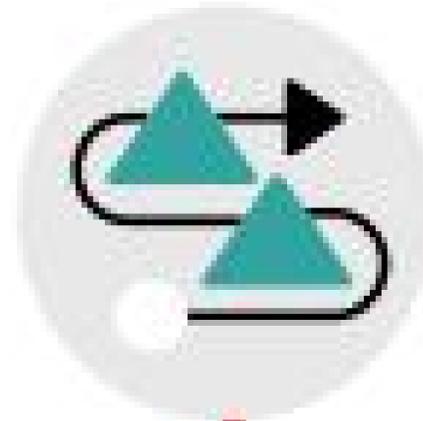
**Passenger  
demand  
forecast**



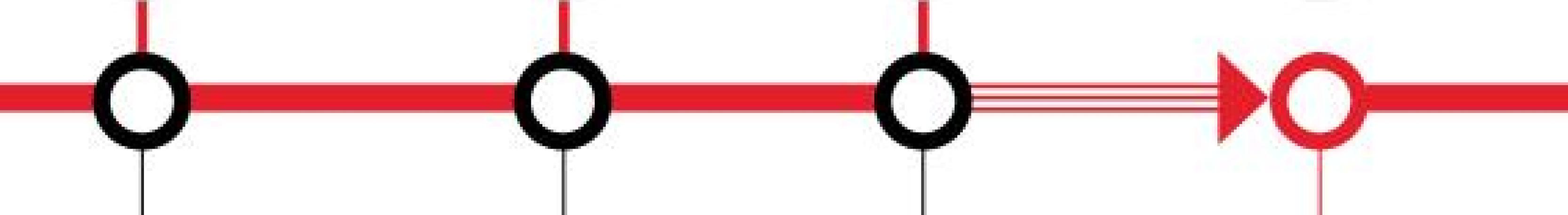
**Energy  
demand  
forecast**



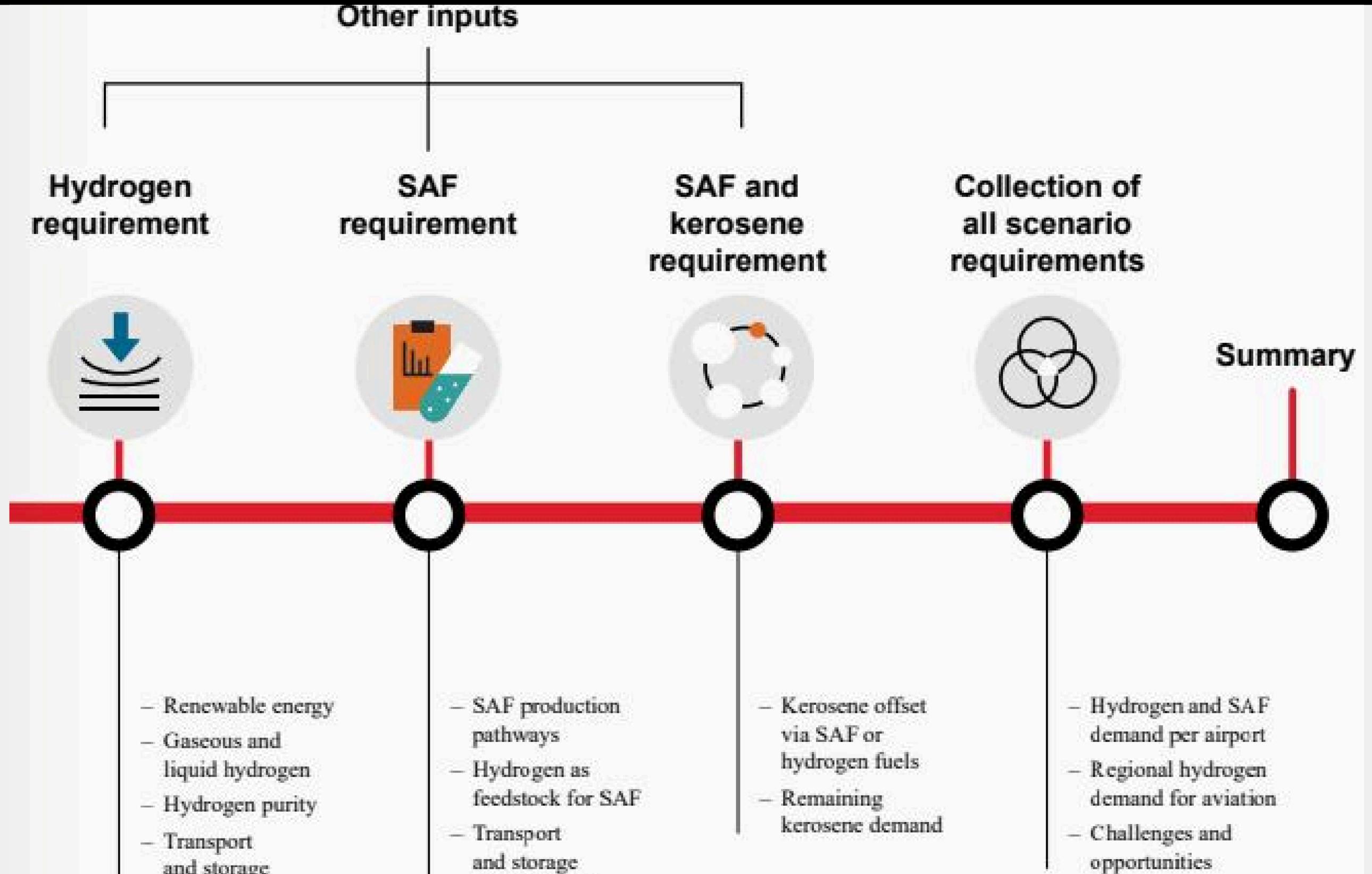
**Scenario  
development**



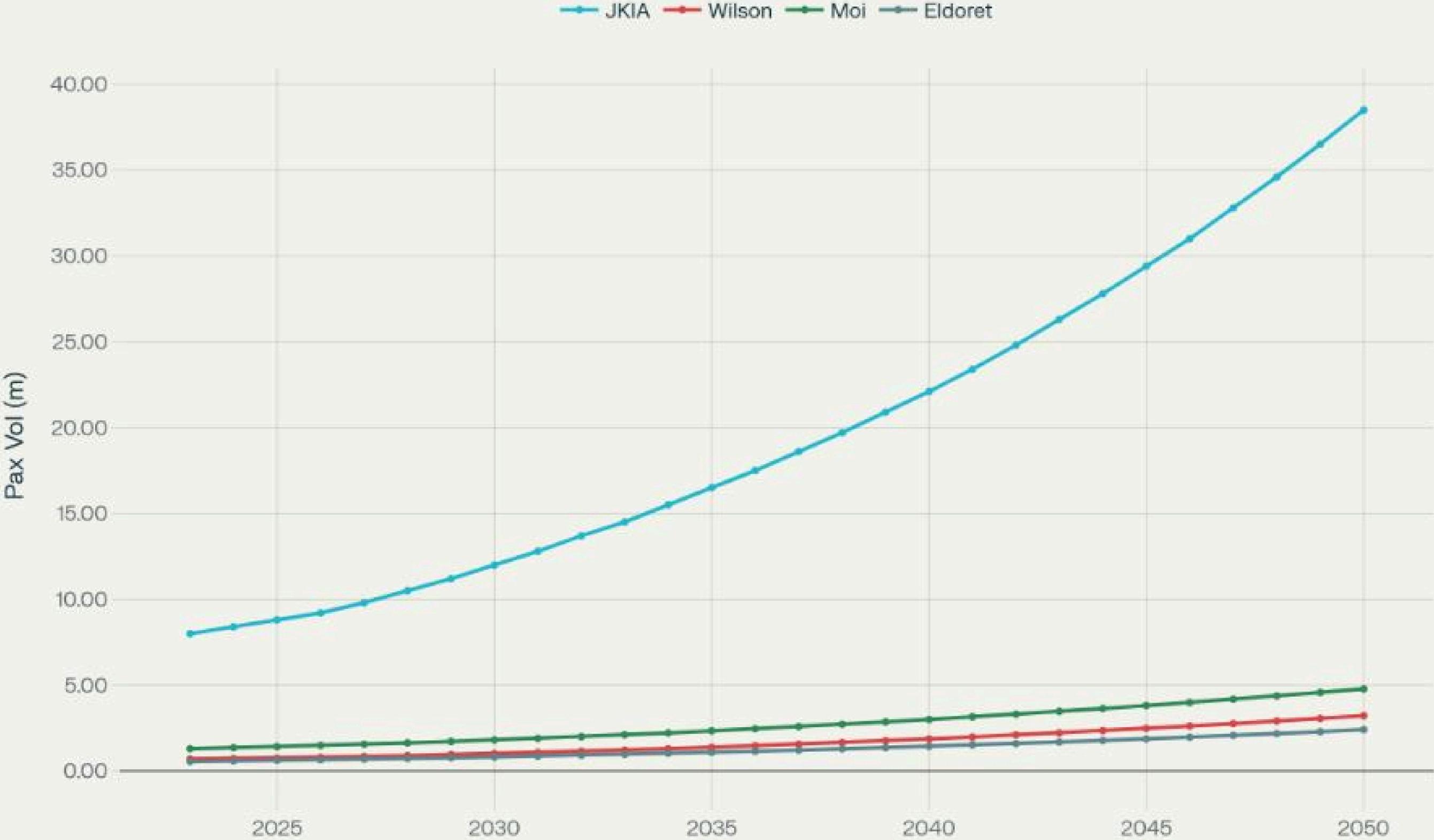
**Scenario  
options**



# Methodology



# Passenger Forecast



# Energy Demand Methodology

01

Flight Distance & Duration: Using great circle distance, calculating flight time, and adding LTO cycle energy

02

Aircraft Fuel Burn Assumptions: Assuming hydrogen aircraft have similar energy efficiency to kerosene aircraft.

03

Seat Capacity Adjustment: Accounting for 10% fewer seats due to hydrogen tank space requirements.

04

Fuel Consumption per Flight: Converting kerosene consumption to hydrogen using energy density value

05

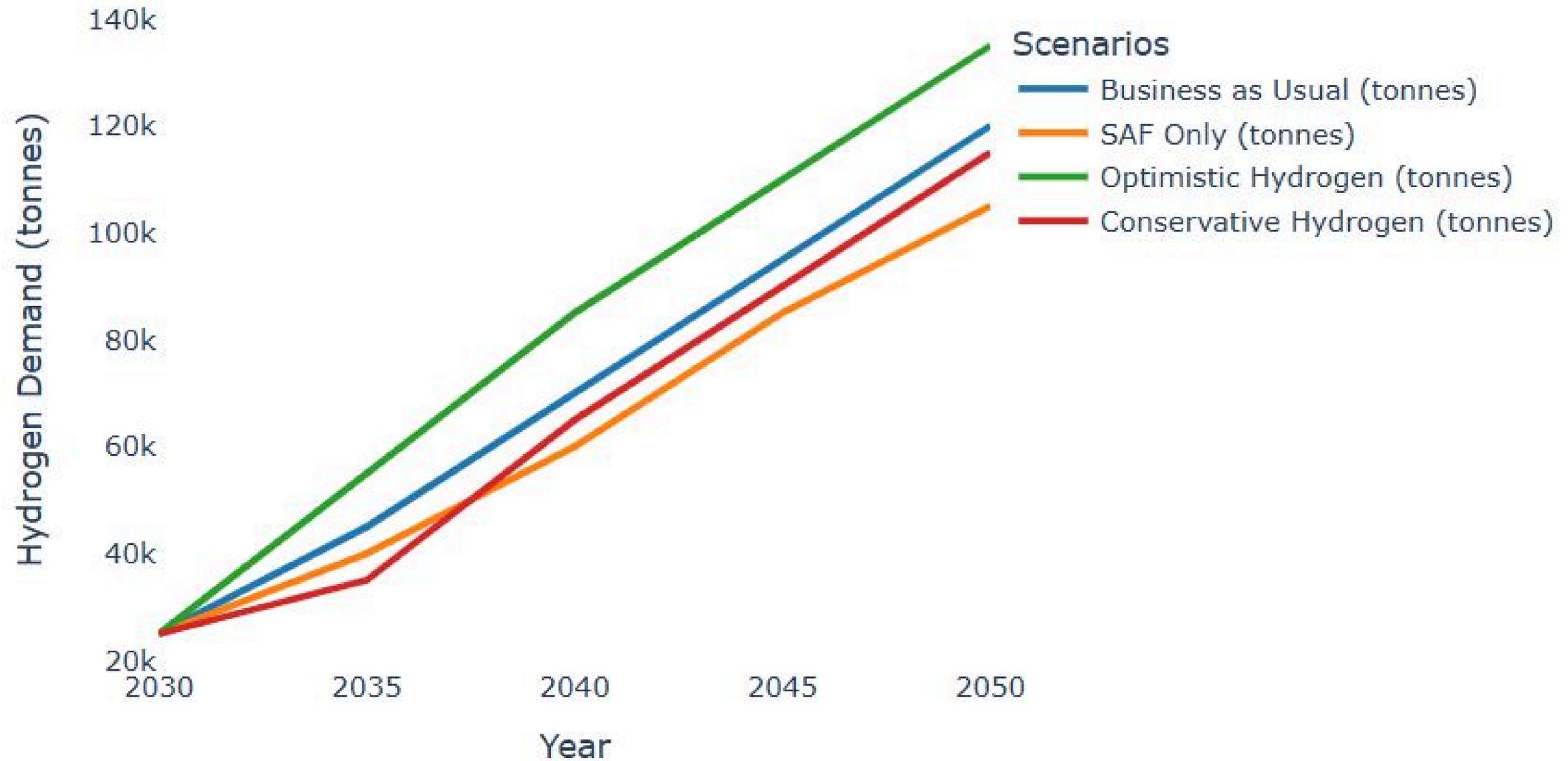
Aggregation Across Flights: Summing demand across all flights

06

Scenario Application: Applying different adoption rates and including SAF

# Hydrogen Demand Projections

## Kenyan Aviation Hydrogen Demand Projections (2030-2050)



# Conclusions

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1. Significant Growth Potential:
2. Strategic Importance of Early Action:
3. Infrastructure Investment Needs:
4. Policy Implications:
5. Risk Management:
6. Complementary Role of SAF: Both scenarios assume that Sustainable Aviation Fuels (SAF) will complement hydrogen, potentially covering up to 50% of fuel use, which reduces the total hydrogen demand but still requires significant infrastructure

# Recommendations

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## Recommendations:

- Develop Flexible Infrastructure
- Invest in Renewable Energy
- Pilot Projects
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- Policy Framework:
  - Collaboration: Foster partnerships between government, industry, and international organizations to share knowledge and resources.

LOOKING  
FORWARD TO  
CONTINUING  
THE  
CONVERSATION