AVIATION CO_2 REDUCTIONS

STOCKTAKING SEMINAR

TECHNOLOGY · OPERATIONS · SUSTAINABLE AVIATION FUELS

SAF competitiveness and scale-up

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Chief Development Officer, European Climate Foundation – World Economic Forum

World Economic Forum's *Clean Skies for Tomorrow* ambition

Ground work to create a fact base

1: Assess SAF feasibility and sustainability

Refine and strengthen existing analyses on feedstock availability, technology readiness and production cost into a concise synthesis

2: Democratize global SAF supply

Design a specific, comprehensive and actionable approach to scaling-up SAF in India and produce a blueprint for other regional pilots

Enablers for scale-up

3: Align on an industry-backed policy proposal

Align on proposed policy interventions to trigger learning curve effects and economies of scale that could benefit the rest of the industry

4: Create a scalable SAF market place

Design a SAF market-place and make a wave of first transactions, design and pilots in 2020, 1st wave of transactions in 2021

5: Develop a blueprint for financing

Develop a blueprint for the financing of the transition to SAF, based on dialogues between aviation players and the finance community

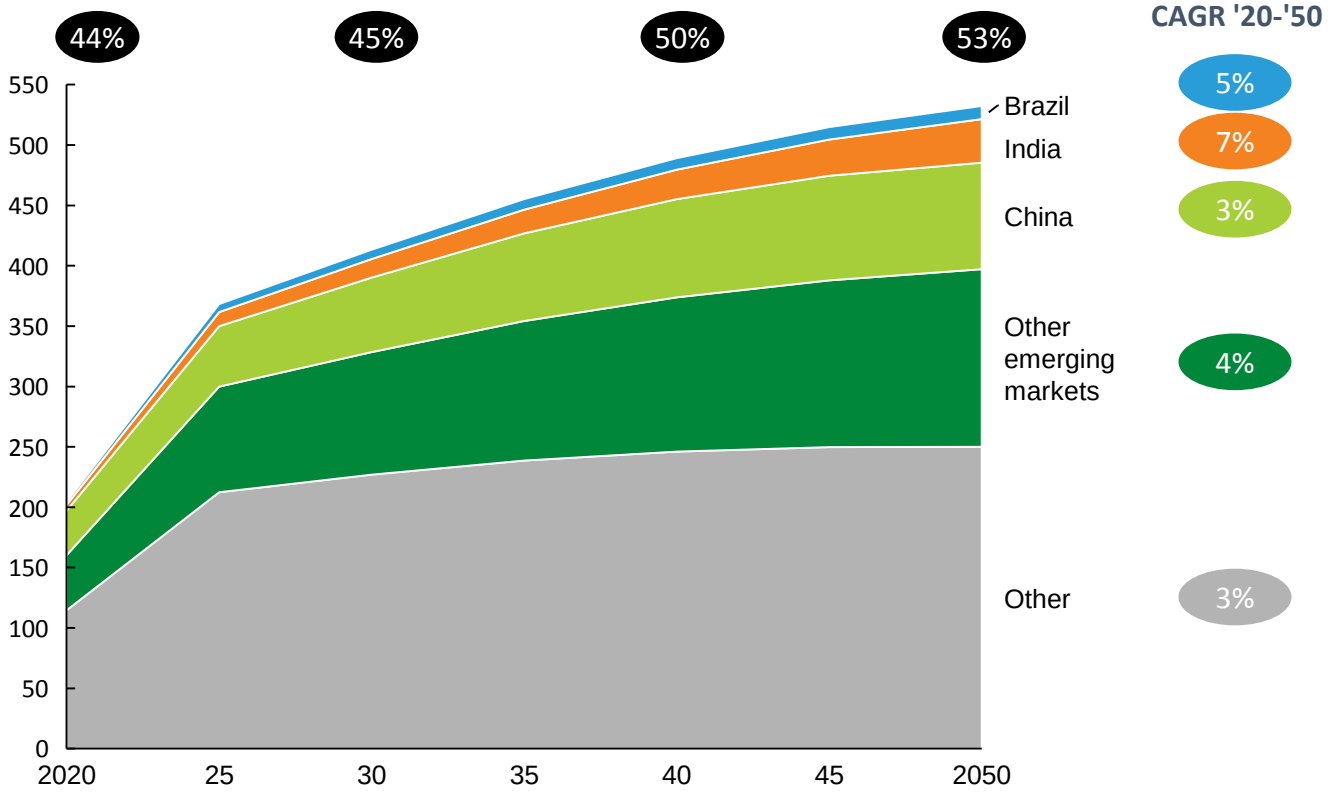
Clean Skies for Tomorrow is a Global Coalition

Sustainable aviation fuel expansion is a global theme

Critical importance of emerging markets

X Share of emerging markets total energy demand, percent

Aviation energy demand, million tons of jet fuel



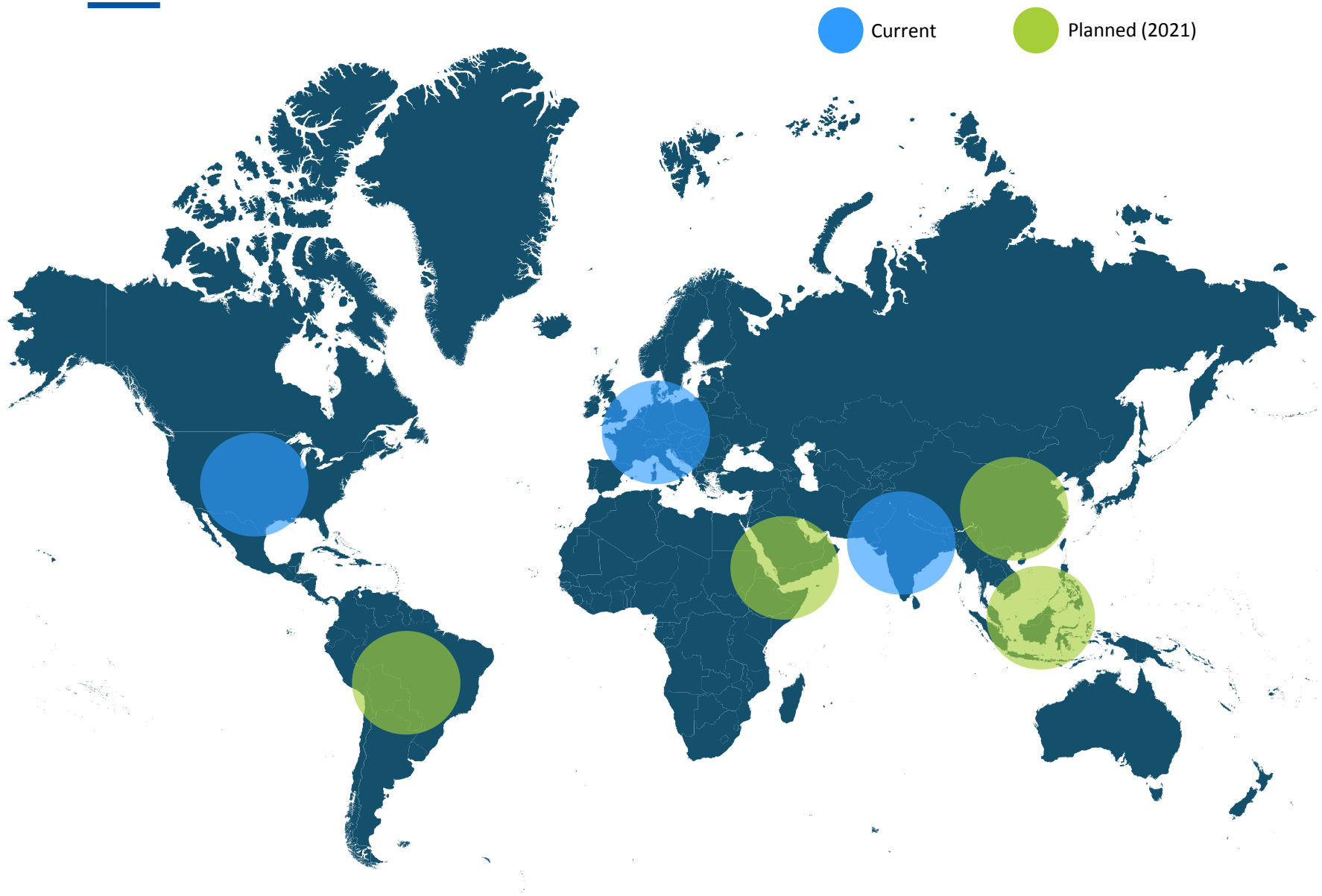
SAF in the focus

Advanced biofuels require biomass such as used cooking oil, agricultural residues or municipal solid waste

E-fuels / synfuel require captured carbon (from industry point source or directly from the air), and green hydrogen from renewable electricity

Many emerging markets are well positioned to provide feedstock and green electricity at competitive costs

Emerging markets are major driver of global demand *AND* supply

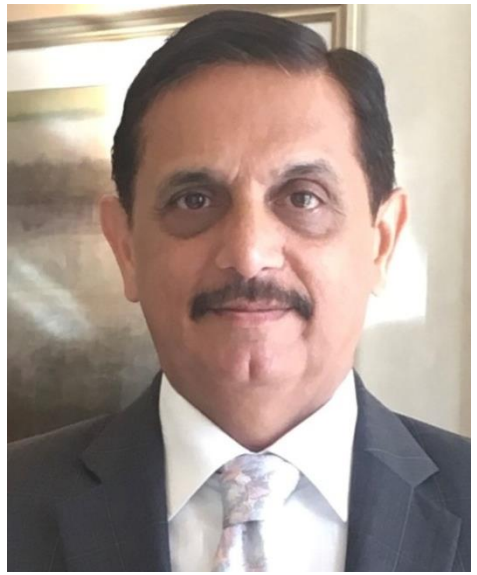


- SAF is the **only large-scale decarbonization option** for the industry until 2040+
- There is enough **sustainable feedstock** available to power aviation in 2030 and beyond
- Places **best suited for large scale** SAF production include India, LatAm, MENA and ASEAN

SAF competitiveness and scale-up

Kamal Hingorani

Chief Customer Officer – SpiceJet



Goal: Fly 100 million domestic passengers on SAF by 2030

- India stands committed to reduce carbon emissions as committed in the Paris Agreement. The aviation industry, while a minor contributor, will play a crucial role by way of optics.
- India has become the third largest domestic aviation market in the world and is expected to overtake UK to become the third largest air passenger market by 2024.
- We have set upon ourselves a target to transport 100 million domestic passengers by 2030 on a 25% SAF blend; requiring 0.9 million tons of SAF.
- To achieve the above, price gap between SAF & ATF must be bridged, for which the primary contribution has to be made by the Government of India by way of tax polices & regulatory mechanisms.
- A public-private coalition through the World Economic Forum is now underway

Scaling-up SAF requires a strategy to bridge the cost gap

Ambition in India:

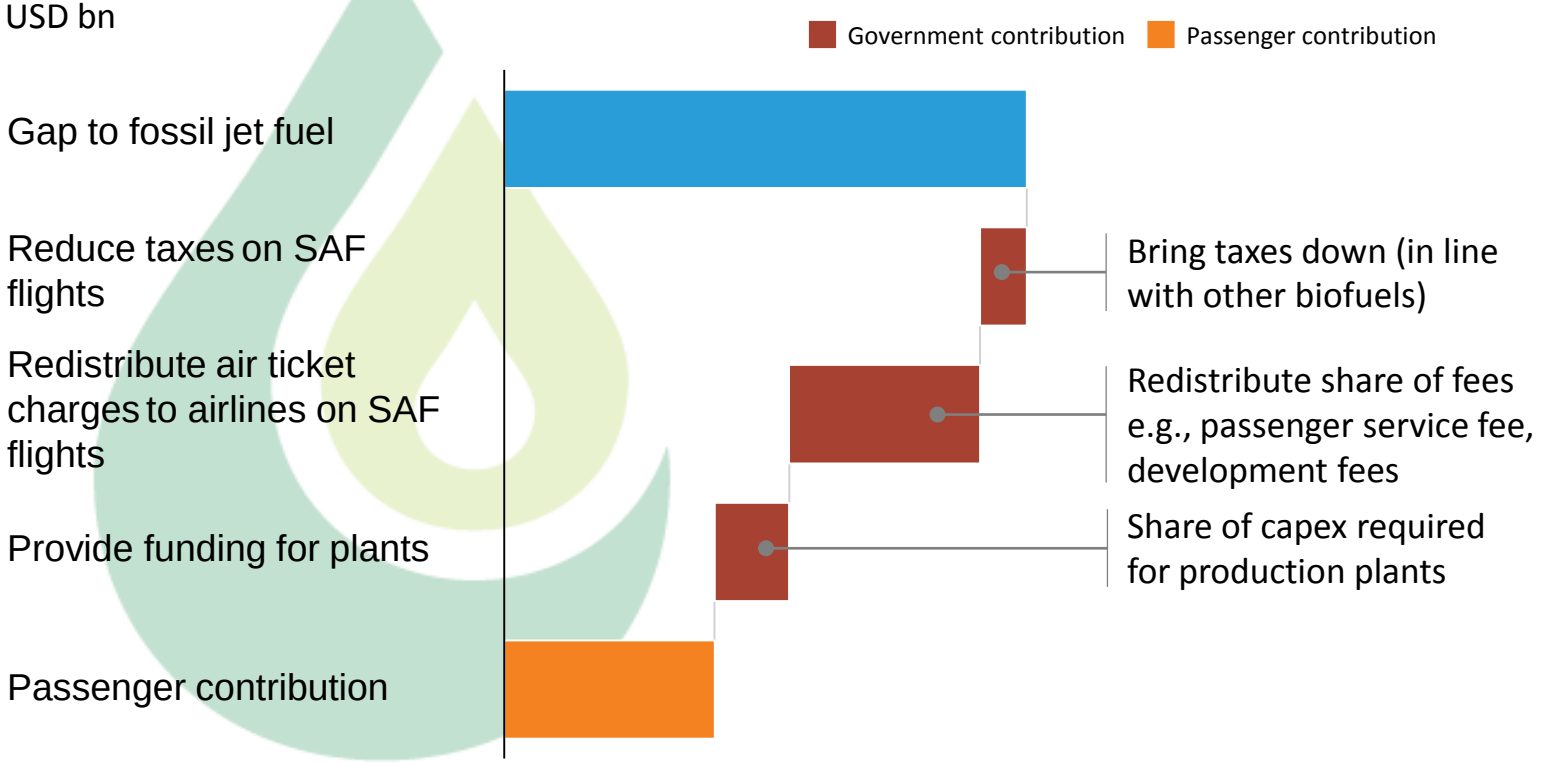
100

million passengers fly domestically on SAF by 2030

SAF production costs 50-150% more than fossil jet fuel

Potential levers to bridge the gap to fossil jet fuel

USD bn



Additional levers can be explored with other stakeholders such as airport authorities, e.g., differentiated airport landing fees for SAF flights or take-off charges on fossil jet fuel flights

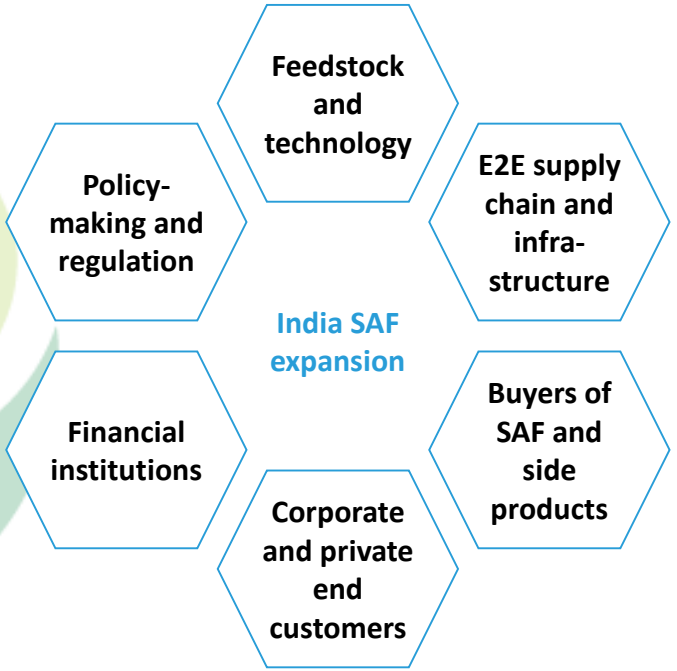
Scaling SAF industry would generate substantial GDP impact

ROUGH ESTIMATES BASED ON PRODUCTION OF 1 MT OF SAF IN INDIA

Approx. USD 4 bn GDP impact

- **Additional income for farmers (+10-15%)**
- **Cleaner skies with less open-air burning**
- **100,000+ new green jobs**
- **Enhanced energy security**
- **Catalyst for efficient waste management**

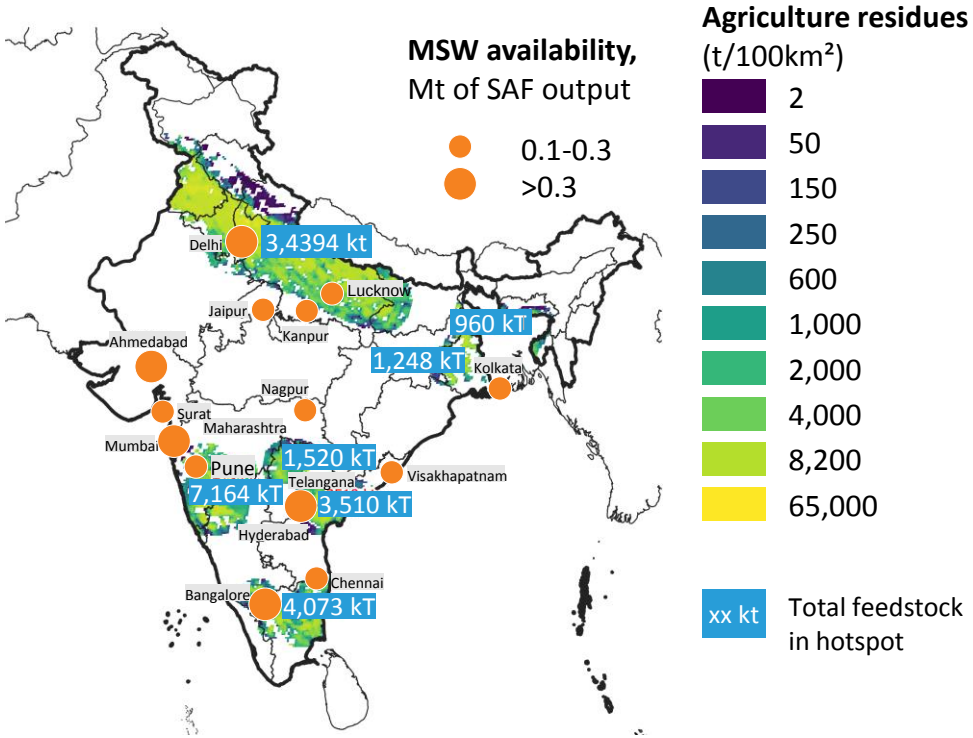
360 degree approach required



Example India: Concentration of municipal waste and agricultural residues shows economically viable potential for 11 Mt of SAF

ROUGH ESTIMATES

Practical feedstock availability…



… allows for significant SAF production

33 Plants based on MSW closely located to large cities

80 Plants based on agricultural residues in six major hotspots

11 million tons SAF output[1]

India case example can serve as a blueprint for other regions

1. Assuming average of 77% yield for AtJ and 55% for Gasification/FT and total output of 0.15 Mt p.a., ~0.6 Mt required feedstock p.a.

SOURCE: ACRE McKinsey solution

Thank You

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