

The main findings of the roadmap are:

- The Ethiopian economy relies heavily on agriculture, identified as an 'enabling sector' in the country's 10-year development plan (2021-2030): *The Pathway to Prosperity*.
- Ethiopia meets fuels demands entirely through imports, with the import of aviation fuel and diesel fuel having increased by 49.4% and 111% respectively from 2010 to 2018.
- The development of biodiesel in Ethiopia has been limited to three pilot plants, with no existing biorefinery within the country.
- Only three blending facilities in Ethiopia presently — used for 5% blending of ethanol with gasoline — could be used for SAF blending. Currently, Ethiopia has no blending mandate for biodiesel.
- In its 15 year growth strategy, the Ethiopian Ministry of Transport prescribes a 10% mix of SAF, which would amount to 530,000 litres of SAF by 2028/2029.
- The Ethiopian oil industry regulatory framework in its current form cannot address the present and future growth challenges it faces.
- The sole commercially available SAF conversion pathway is Hydroprocessed Esters and Fatty Acids technology (HEFA), an oil-to-fuel pathway.
- Agricultural residues, castor (*Ricinus sp*), Ethiopian mustard/Brassica carinata, *Jatropha curcas*, sugarcane, and water hyacinth were examined as potential feedstocks for delivering locally produced SAF. Castor (foreseen in the Biofuels Development and Utilisation Strategy) and Ethiopian mustard (native to the central highlands of Ethiopia) stand out as the most prominent candidates for SAF production via HEFA technology, although more research is needed.
- Smallholder farmers scattered over large areas in the country, scarce inputs, inefficient handling chains, and high post-harvest losses contribute to moderate oil feedstock production in the country, with potential for improvement.

Taking these findings into consideration, the key prerequisites identified for the development of a national SAF industry are to:

- Ensure sustainable and non-erratic production of high oil feedstock volumes in compliance with the requirements of the *Roundtable on Sustainable Biomaterials* (RSB) sustainability framework.
- Proceed with the required legal and regulatory amendments to clearly link aviation with biofuel development.
- Realise the Ethiopian government's clear intention to support the development of the national biofuel industry — specifically focusing on SAF production — by fostering the participation of the private sector via the establishment of appropriate joint-venture and public-private partnership schemes, so long as fair competition is not compromised.
- Initiate focused feasibility studies on the utilisation of selected feedstocks for SAF production to validate yields, taking into consideration environmental and social impacts.
- Invest in improving the poor public infrastructure (i.e., roads and utilities) that are hindering supply chain logistics and economics.
- Elevate currently low research and investment levels, when compared to similar African countries.
- Invest in the development of human resources, preparing workers for the highly skilled roles required — particularly for feedstock processing.

The roadmap for development of a national SAF industry ideally consists of three consecutive phases:

1

Phase 1 (2021–2023):
ESTABLISH AN ENABLING
POLICY ENVIRONMENT

2

Phase 2 (2024–2028):
DEMONSTRATE POTENTIAL
& ENSURE AN OPEN ECONOMY

3

Phase 3 (2029–2030):
FORWARD-LOOKING
PLAN

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Sustainable Aviation Fuel (SAF)

A ROADMAP FOR ETHIOPIA

For the full report visit <https://rsb.org/saf-roadmap-for-ethiopia/>

To explore and advance Ethiopia's capacity to produce biofuels for use as Sustainable Aviation Fuel (SAF), the Roundtable on Sustainable Biomaterials (RSB) initiated the development of a 10-year SAF Roadmap for the country.

The main purpose of this roadmap is to identify the ideal feedstock and technology mix that adheres to the robust social and environmental sustainability requirements of the RSB, to inform policymakers of the necessary policy actions needed to incentivise SAF, and to support the development of more proposals and plans aimed at unlocking further funding and investment into SAF research, development, and pilot production.

The roadmap was developed in close collaboration with a national SAF Steering Committee representing local government, experts and the national airline. The methodology includes examining documentation reflecting the country's internal and external environment, SWOT and GAP analyses, and research of feedstock availability and SAF conversion pathways. Global SAF developments and trends have also been taken into consideration.



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The SAF Steering Committee — composed of government ministries, private sector companies, research institutions, and regulatory bodies — has been integral in the development of this roadmap.

Members: Ethiopian Petroleum and Biofuel Corporation; Ethiopian Petroleum Supplies Enterprise; Ethiopian Rural Energy Development and Promotion Center; Ethiopian Oil Companies Association; Ministry of Trade and Industry; Ethiopian Biotechnology Institute; Ethiopian Agricultural Research Council Secretariat; Ethiopian Airlines Group; Ethiopian Civil Aviation Authority; Environment, Forest and Climate Change Commission; Addis Ababa University; and Ministry of Mines and Petroleum

A ROADMAP FOR ETHIOPIA

1.

ESTABLISH AN ENABLING
POLICY ENVIRONMENT

2.

DEMONSTRATE POTENTIAL
& ENSURE AN OPEN ECONOMY

3.

FORWARD-LOOKING
PLAN

ETHIOPIAN ECONOMY IS BASED PREDOMINANTLY
ON AGRICULTURE,
with ambition to diversify rapidly as it aims
to become a middle income country

SMALLHOLDER FARMERS
ARE SCATTERED
over large areas

Current fuel demand is met
**ENTIRELY THROUGH
IMPORTS**

Agricultural Residues, Castor,
Ethiopian mustard/Brassica carinata,
Jatropha, Sugarcane, and Water Hyacinth
**HAVE ALL BEEN EXAMINED AS
POTENTIAL FEEDSTOCKS**
FOR DELIVERING LOCALLY PRODUCED SAF


**STRENGTHEN
INVESTMENT
RESEARCH**

**GOVERNMENT MUST SUPPORT
THE DEVELOPMENT OF
A BIOFUEL INDUSTRY**
by partnering with the private sector
and international partners

**INVEST IN
HUMAN CAPITAL**
for highly skilled roles

Current biofuel production is
**LIMITED TO BIOETHANOL
IN 2 DISTILLERIES**
(no current SAF production)

**MINIMAL EXISTING
NATIONAL INFRASTRUCTRE**
for fuel blending

There is currently
**NO NATIONAL
BLENDING MANDATE**
for biodiesel

Ensure feedstocks comply with
**GLOBAL BEST PRACTICE FOR
SOCIAL AND ENVIRONMENTAL
SUSTAINABILITY**

Invest in and improve
**PUBLIC
INFRASTRUCTURE**

Advance the creation of an
**ENABLING
POLICY ENVIRONMENT**
for SAF and biofuel production and use

The Ethiopia Ministry of Transport prescribes a
10% BLEND OF SAF
in its 15-year strategy, published in 2021

FLYING WITH SAF!

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