NUCLEAR AVIATION PROJECT

The IATA commitment...

The IATA is committed to a net carbon-emission goal by 2050.

HOW? do we make this happen

Protecting workers
The EPA will be able to adopt foreign mining standards and uphold them for domestic protection

Updating runways
Nuclear powered planes will be much heavier, sturdier runways will pave the way for net-zero

Streamlining flights
Constant operation of the nuclear reactor will provide little downtime between flights.

Environmental Impact

In the sky

- NO Greenhouse Gas Emissions
- NO Contrails
- NO Aviation-induced cirrus

On the ground

Mining and Milling

- Mitigable radioactive dust and radon gas from mining
- Preventable contaminated tailing slurry from milling

Mining

Milling

Enrichment

Implementation

Storage

Recycling

Disposal

WHY? NUCLEAR

Nuclear Energy is a safe, clean, and reliable resource

as low as **15 GRAMS** of carbon-dioxide per kilowatt hour produced

CO_2/KWh

1 Barrel of Jet A-1	VS	1 Kg of Natural Uranium
• costs $113/barrel		• costs $130/kilogram
• requires significant farmland		• can produce **40 Mil** KWh/kg
• polluting combustion		• net-zero emissions

FUEL LIFECYCLE

Fuel
Using low-enriched uranium-235 will provide the highest legal fuel density

Mining
Mining uranium domestically will be safer and more efficient

Transport
Storage casks via truck will allow for safe and reliable cross-country travel

Storage
Muon tomography can monitor spent nuclear fuel in long-term storage

In case of emergency...

- Control rods can be injected to quickly stop a reaction
- Wings are connected through the reactor section of fuselage
- Staff will be specially trained to handle all scenarios

POLICY CHANGES

Funding and Licensing must be set in place before nuclear energy can get a foothold in commercial applications

$1,773,000

Money set aside by the DOE to support diverse civilian nuclear energy projects

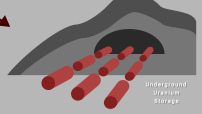
American Nuclear Infrastructure Act 2021

Creates unique licensing requirements of nuclear reactors for non-electric applications using a technology inclusive regulatory framework

Where does the fuel go?

Spent Nuclear Fuel (SNF)

Spent fuel and other byproducts will be sent to underground storage facilities like Palo Verde, Arizona

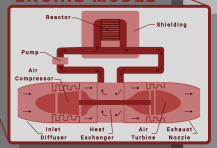


PLANE STRUCTURE

Our design is inspired by the NB-36

Indirect Heating	Allows for clean thrust from the engines
Molten Salt Heat-Sync	Prevents radioactive material from escaping the core assembly
Shielding	A combination of lead and polyethylene prevent volatile radiation from reaching passengers
Heat Transfer Pipes	4 sets of pipes will carry molten Lithium to heat compressed air
HALEU Reactor Core	Small form factor, high energy output, and safe for use in commercial aircraft

ENGINE MODEL



Finances

Nuclear has a very high entry cost

$1.1 Billion
The total cost of a nuclear plane. This is compared to a 135 million standard Boeing 737

$100 Million
After the initial cost of building a laser-enrichment plant, the upkeep for a year of operation

$1.7 Billion
The total upfront capital needed to have a fully functional nuclear powered plane

Timeline

- **2024** — Research into modified HALEU reactor begins
- **2026** — Legislation is brought forth to the IAEA
- **2030** — NRC outlines licensing for nuclear aviation
- **2035** — Mining regulations completed for Navajo land
- **2040** — Proof of concept plane is in production
- **2042** — Uranium production is increased to meet demand
- **2043** — FAA begins transition of cargo planes to nuclear
- **2045** — Commercial aircraft begin production with nuclear

NOW → 2050

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