TRANSMUTEX

Transmutex Accelerator Projects: From PSI Operation to Scalable Facilities

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On behalf of the Transmutex Team

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TRANSMUTEX

1. Company
2. START
3. HI-BEAM
4. ML application (PSI experiment)

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1. Company

World-Class Leadership Team Rooted in Deep Technological Expertise

Transmutex was founded in 2019 in Geneva and now boasts a team of 60+ employees with 29 PhDs

Franklin Servan-Schreiber
Chief Executive Officer & Co-founder

Dr Donovan Maire
Chief Technical Officer

Craig Kelly
Chief Financial Officer

Jean-Christophe de Mestral
Director & Head of Government Relations and Regulatory Affairs

Dr Franz Strohmer
Head of Fuel Manufacturing & Reprocessing

Dr Marco Busch
Head of Accelerator

Dr Karl Johnston
Medical Team Lead

Dr Massimo Barbagallo
Head of Target

CERN, cea, AREVA, IRSN, BEVATECH, SPACEX, ORYX PETROLEUM, msc, SONY

Dr Vasudha Verma
Head of Transmutation Reactor

Dr Guilhem Lacaze
Head of Software

60+ Employees

29 PhDs

17 Nationalities

2. START

START Mission

Reinventing Nuclear Energy

Non-proliferant

Sustainable

Lower cost

Accelerator Driven System (ADS)

TRANSMUTEX

Particle Accelerator (Cyclotron)

800MeV – 5mA

The most powerful commercially available particle accelerator for safe, subcritical system operations

Thorium Fuel Cycle

Thorium as the primary fuel allows maximum burning of nuclear waste while minimizing the production of highly radioactive spent nuclear fuel

Lead Cooled Fast Reactor

Fast reactor with novel core layout and target design for more efficient burn and breeding with inherent passive safety

Pyroprocess Recycling

On-site waste reprocessing, new fuel fabrication and isotopes & rare metal production for medical and industrial use

Subcritical
Transmuting
Accelerated
Regenerative
Technology

3. HI-BEAM

HI-BEAM Mission

Scaling-up Nuclear Medicine

Ac-225 Industrial Production by 2030

Lower cost for Ac-225

De-risk START accelerator reliability

HI-BEAM is a Key Derisking For our Energy and Nuclear Waste Reduction System

High **I**ntensity **B**reakthrough **E**ngineering for **A**dvanced **M**edicine

HI-BEAM: Medicine

Commercial-scale production of radionuclides

Applications:
Medical Isotopes
Materials Testing

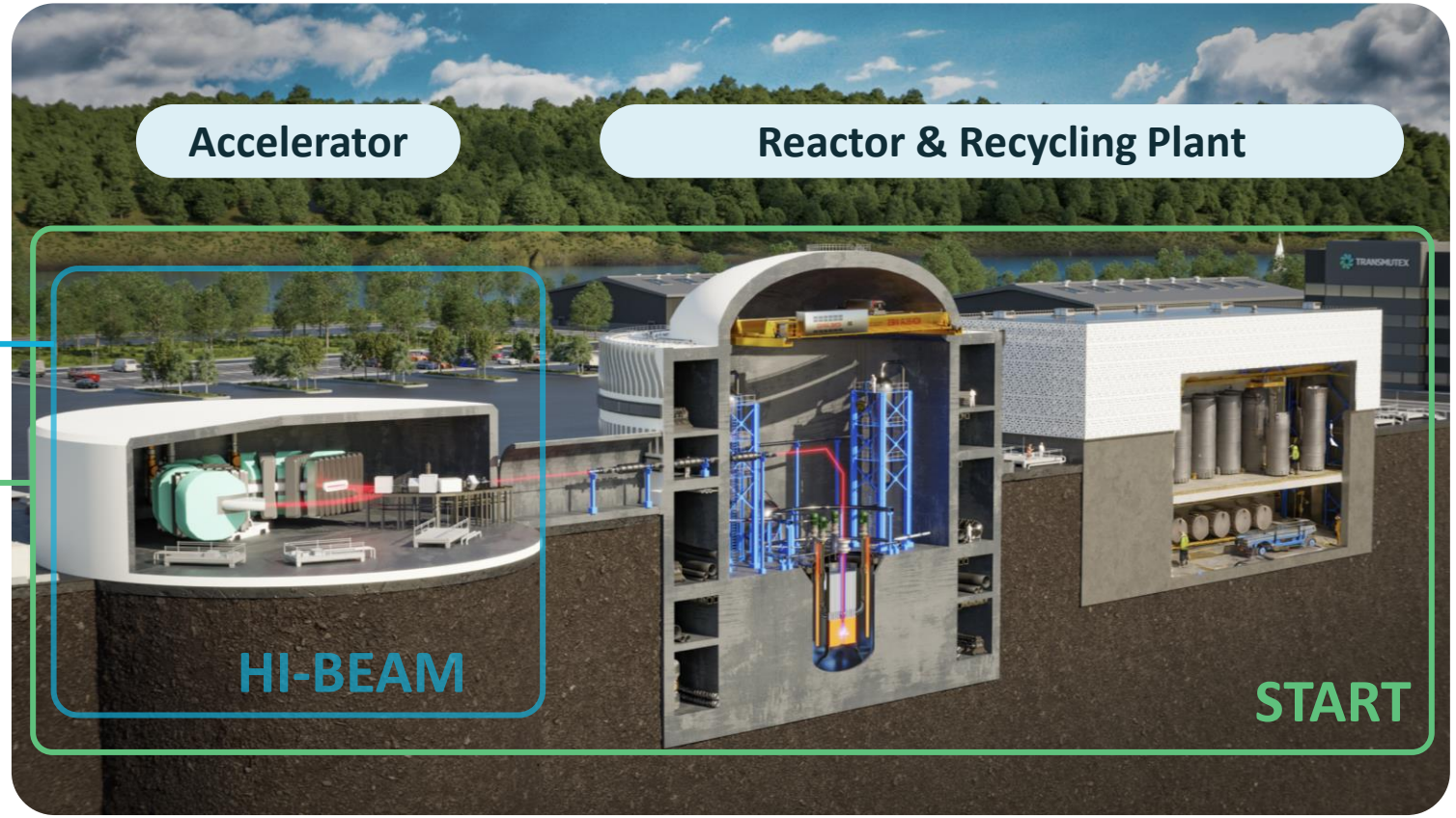
Immediate revenue opportunity

START: Energy & Waste

Fully integrated, accelerator, reactor and recycling plant

Applications:
Energy & Waste

Future goal



START will produce carbon-free baseload power while also achieving a dramatic reduction in volume of long-lived waste
HI-BEAM will produce medical isotopes for oncology

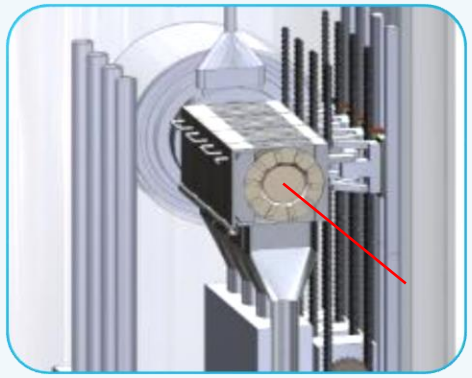
HI-BEAM is Globally Unique Radioisotope Production Capacity

Established and scalable technology from the existing TRIUMF process to provide Ac225 for clinical trials

High Power Cyclotron

0.96 MW (200 MeV & 4.8 mA)

Target Stations



Irradiation of natural thorium disk targets

Extraction & Processing Facilities

Hot cells

GMP Grade Ac-225

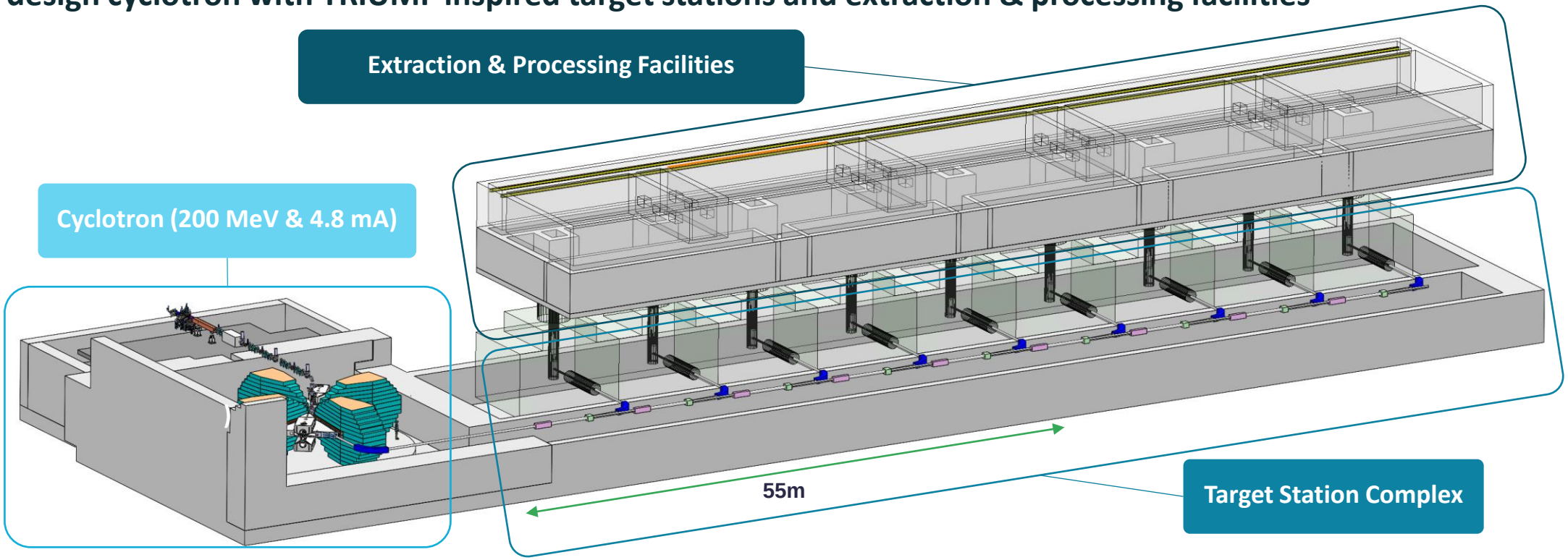
Leading Global Pharmaceuticals

Clinical Trials & Future Commercial Deployment

Transmutex's **extensive experience with high-power accelerators and thorium** enable HI-BEAM

Clear Roadmap and Tangible Development Milestones for HI-BEAM

PSI design cyclotron with TRIUMF inspired target stations and extraction & processing facilities

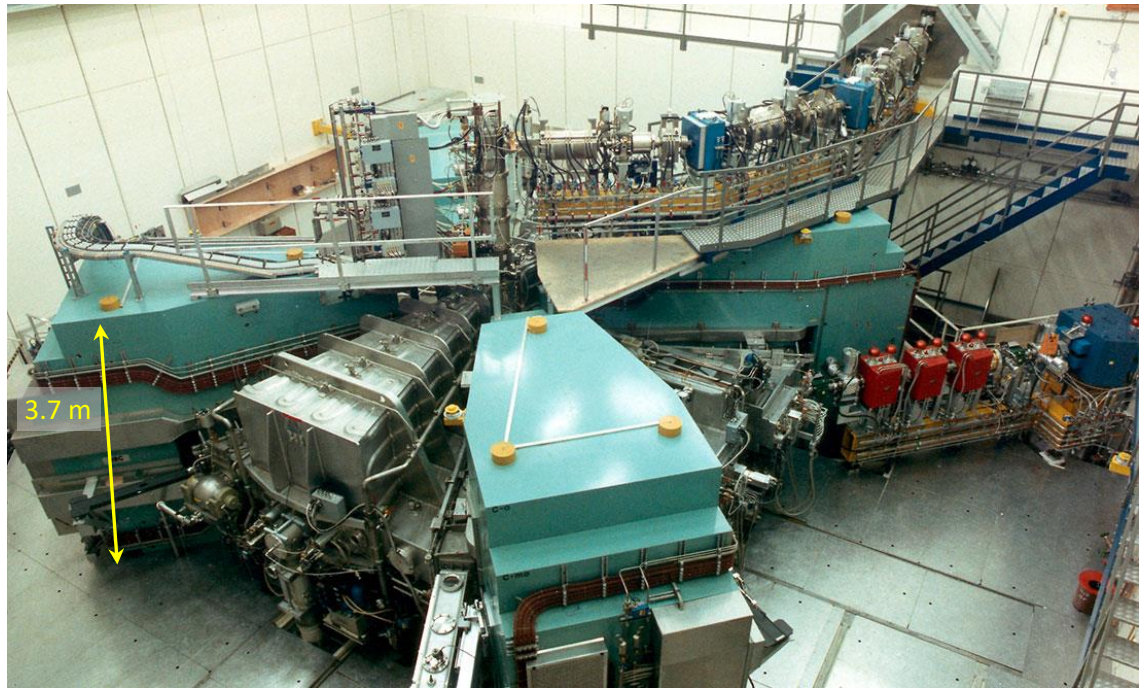


2026	2027	2028	2029	2030
Strategic Supply Agreement(s) Site Selection Long-Lead Procurement	Ion Source	Initial Beam Transfer Line	Cyclotron	Target Stations and Extraction & Processing Facilities	First Actinium-225 Production & Sales

Single Stage Cyclotron Design Based on PSI HIPA Injector 2

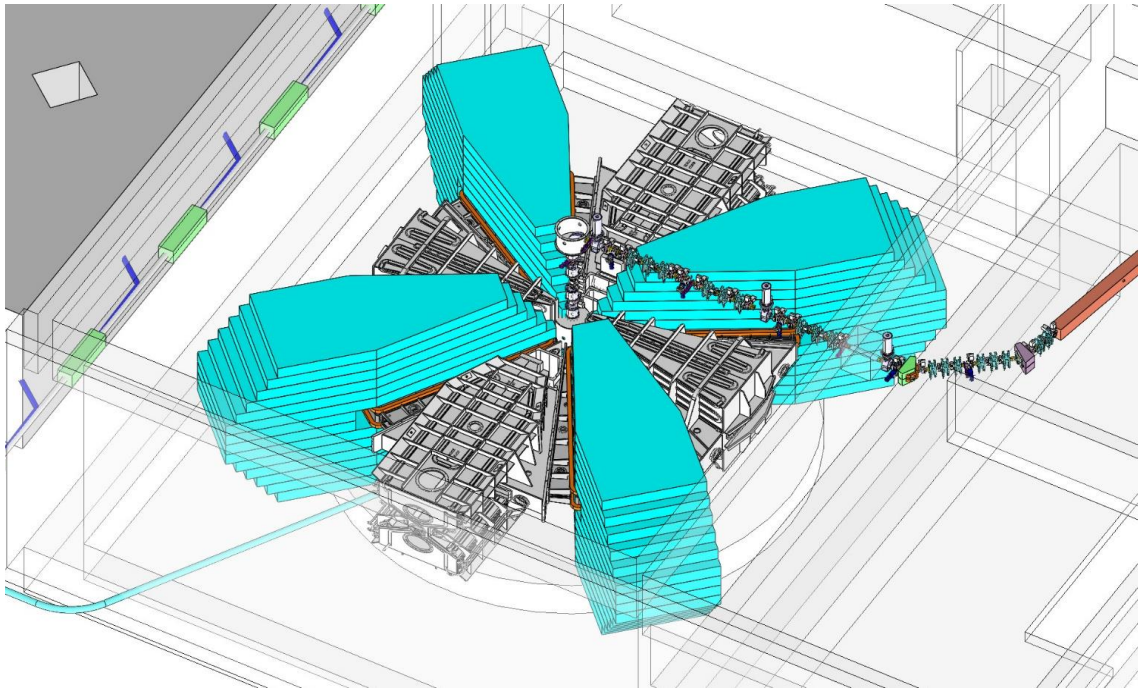
Adjusted magnet and cavity parameters with improved injection and extraction scheme to minimize losses and activation

PSI Injector 2 (72 MeV)



Diameter: 12 m, weight: ~800 t

HI-BEAM cyclotron (200 MeV)



Diameter: 16 m, weight: ~3000 t

Higher proton energy requires heavier and larger diameter cyclotron

PSI: Paul Scherrer Institute, Switzerland

4. ML application

Transmutex Demonstrated Cyclotron Operation by ML at PSI (2025)

Transmutex team at PSI HIPA control room

What Was Done:

- Integrated Machine Learning (ML) algorithms into cyclotron operation workflow
- ML supported beam tuning and parameter optimization
- Real-time analysis of machine and beam diagnostics

ML Functions in Operation:

- Automated optimization of magnet currents and RF parameters
- Prediction and correction of beam instabilities
- Detection of abnormal operating conditions
- Operator decision support during commissioning and routine runs

Results:

- Re-tuning accelerator **6x faster**
- **Stable** operation
- **No interlocks**

We successfully operated a cyclotron with ML-assisted control, demonstrating feasibility of intelligent accelerator operation

Thank You!

Contact us for more information:
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