



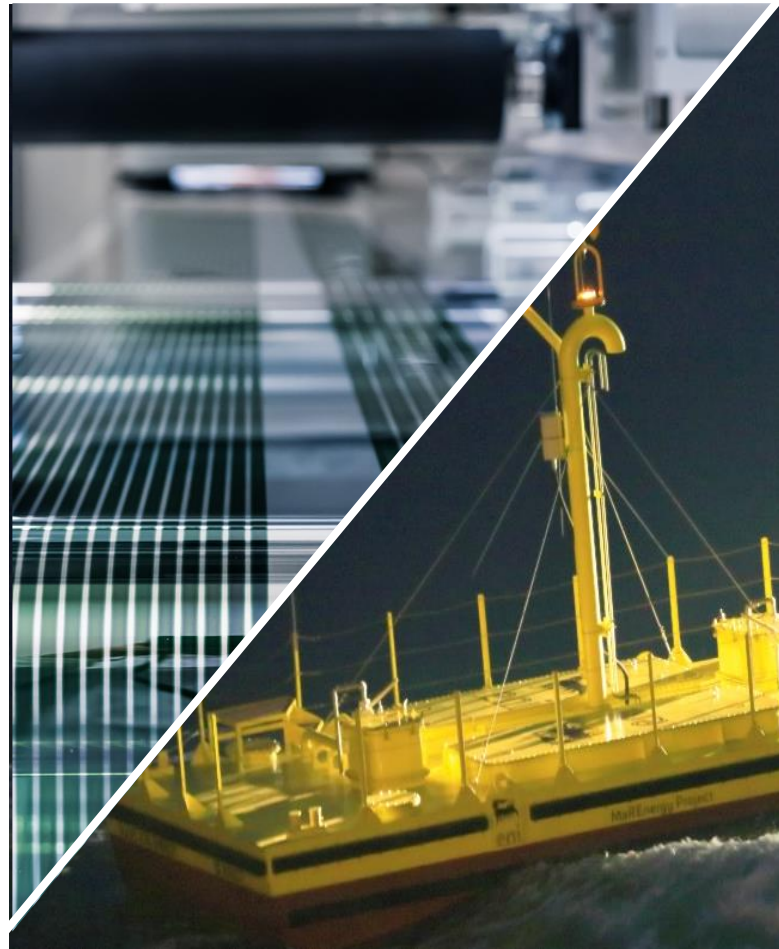
FOCUS ON INNOVATIVE TECHNOLOGIES

R&D TECHNOLOGY PLATFORMS

CIRCULAR ECONOMY



CARBON NEUTRALITY



OPERATIONAL EXCELLENCE



A SINGLE R&D TEAM FOR ALL ENI BUSINESSES



AN INDUSTRIAL R&D TO SUPPORT ENI NEEDS



Waste to Fuel Pilot plant - Novara

PEOPLE

1,500

NETWORK

70

UNIVERSITIES AND
RESEARCH CENTERS

FACILITIES

7

CENTERS





ENI'S BIO-REFINERIES

A REAL EXAMPLE
OF BUSINESS TRANSFORMATION

BIO-FUELS STRATEGY: ECOFINING™ TECHNOLOGY

RECONVERSION OF A TRADITIONAL REFINERY INTO A BIO REFINERY
TO TRANSFORM ORGANIC FEEDSTOCK AND WASTE INTO HIGH QUALITY BIO-FUELS

INPUT

TO DATE

- **UCO** (Used Cooking Oil)
- **Certified Palm Oil**
- **Tallow**
- **Waste**

**PALM OIL FREE TARGET
@2023**

NEW ALTERNATIVE FEEDSTOCK

- Microbial Oil
- Algal Oil
- Castor Oil

PROCESS

Pre-Treatment



ECOFINING™



OUTPUT PRODUCTS

TO DATE

- **BIO-DIESEL HVO**
(Hydrotreated Vegetable Oil)
- **BIO-LPG**
- **BIO-NAPHTHA**

FURTHER POSSIBLE PRODUCTS

- **BIO-JET FUEL**





WASTE TO FUEL

A PROPRIETARY TECHNOLOGY
FOR CIRCULAR ECONOMY

WASTE TO FUEL TECHNOLOGY

TERMOLIQUEFACTION PROCESS OF THE ORGANIC FRACTION OF MUNICIPAL SOLID WASTE
TO PRODUCE BIO-OIL TO BE USED AS MARINE BUNKER FUEL

INPUT

ORGANIC FRACTION OF
MUNICIPAL SOLID WASTE



PROCESS



OUTPUT PRODUCTS

BIO-OIL up to 16%
as marine bunker fuel



WATER up to 80%
for industrial and irrigation purposes

PILOT SCALE

250 t/y PILOT PLANT

RUNNING SINCE DECEMBER 2018

KEY FIGURES FOR 1 INDUSTRIAL PLANT

150,000 t/y PLANT SIZE



FEEDSTOCK

Waste produced by



~**1.5**
Mln people

PRODUCTION



Bio-Oil
up to 24 kton/y



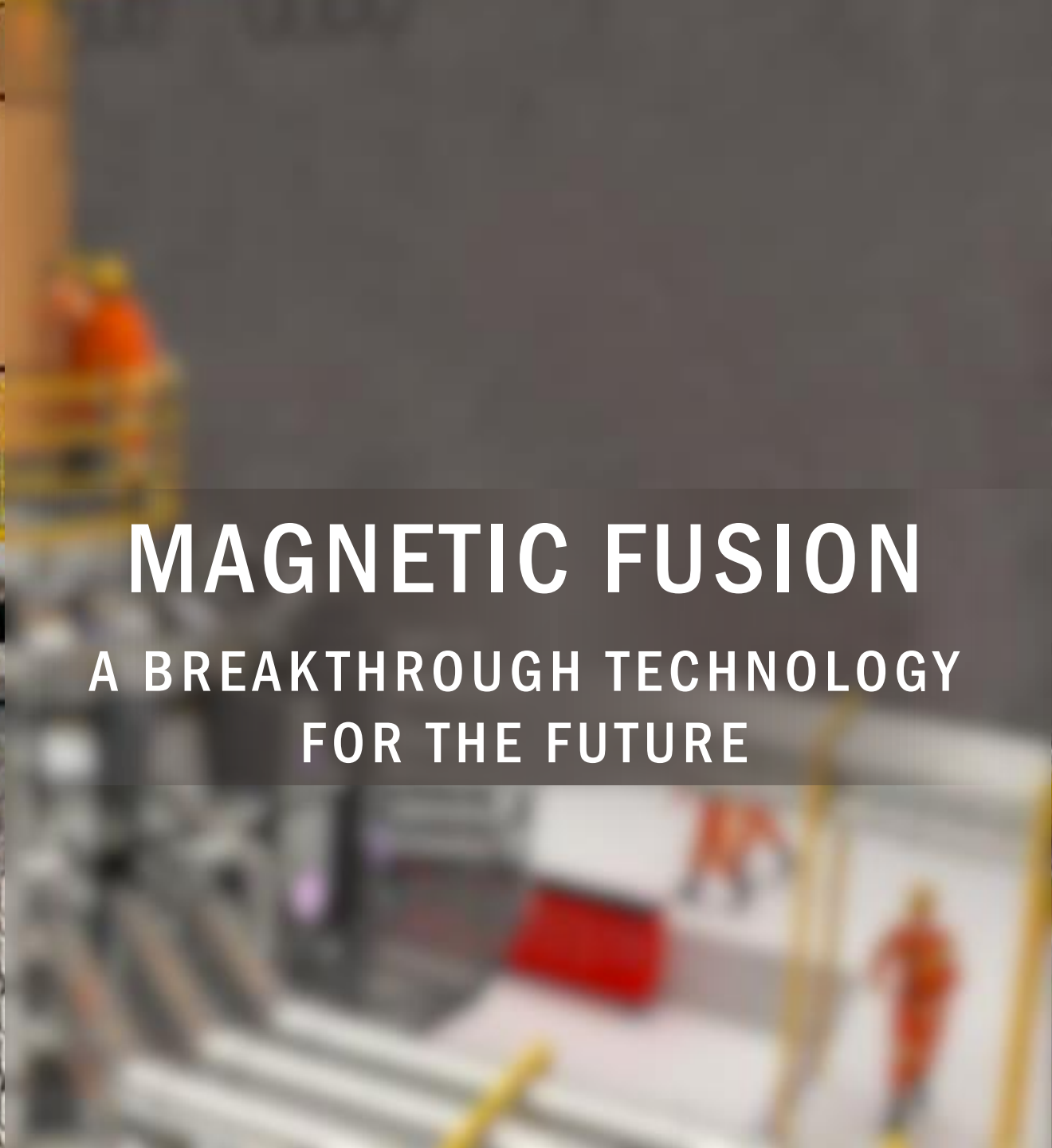
Water
up to 120 kton/y





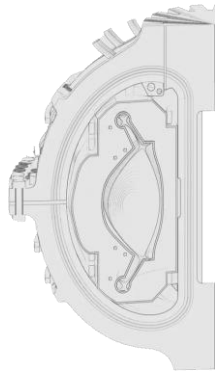
MAGNETIC FUSION

A BREAKTHROUGH TECHNOLOGY
FOR THE FUTURE



MAGNETIC FUSION – A BREAKTHROUGH TECHNOLOGY FOR CLEAN AND RELIABLE ENERGY

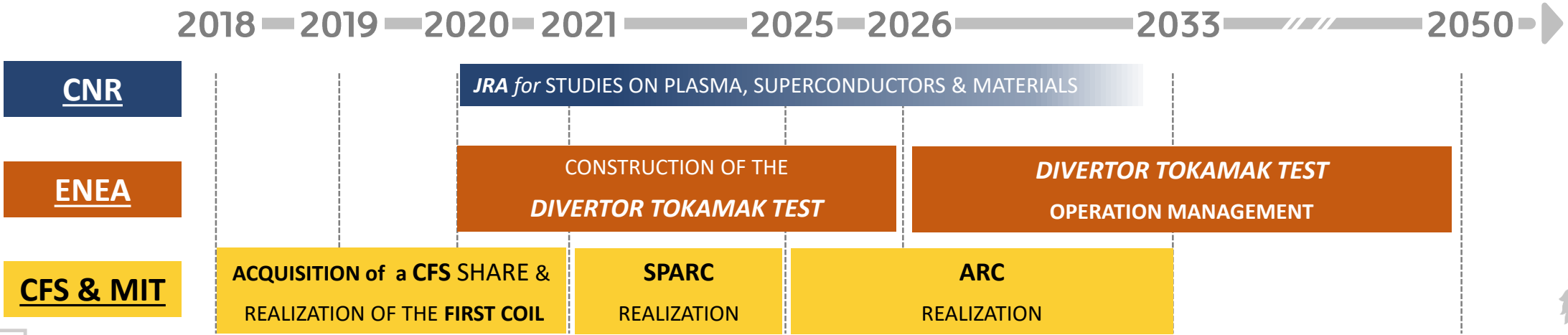
DEVELOPMENT OF TECHNOLOGIES LEADING TO THE **CONSTRUCTION AND OPERATION OF THE FIRST INDUSTRIAL PLANT** THAT CAN ENSURE A **CONTINUOUS AND PROFITABLE PRODUCTION** OF ENERGY FROM FUSION BY MAGNETIC CONFINEMENT



HIGHLIGHTS

- NO EMISSION OF AIR POLLUTANTS AND GREENHOUSE GASES
- ABUNDANCE OF FUEL
- OPERATIONAL SAFETY DUE TO CONTROLLABILITY OF THE REACTION

COLLABORATIONS ON A GLOBAL SCALE



* **CFS** = COMMONWEALTH FUSION SYSTEM | **CNR** = ITALIAN NATIONAL RESEARCH COUNCIL | **ENEA** = ITALIAN NATIONAL AGENCY

