Where energies make tomorrow

Process Technology

Proprietary technologies and products
for the downstream industry

T.EN TECHNIP ENERGIES

Contents

About Technip Energies

Technip Energies is a leading Engineering & Technology company for the energy transition, with leadership positions in LNG, hydrogen and ethylene as well as growing market positions in blue and green hydrogen, sustainable chemistry and CO_2 management. The company benefits from its robust project delivery model supported by extensive technology, products and services offering.

Operating in 34 countries, our 15,000 people are fully committed to bringing our client's innovative projects to life, breaking boundaries to accelerate the energy transition for a better tomorrow.

Technip Energies is listed on Euronext Paris with American depositary receipts ("ADRs"). For further information: www.technipenergies.com.

Process technology

Technip Energies' Process Technology licenses a broad portfolio of proprietary technologies for the energy transition and the downstream onshore sector.

Our portfolio and experience in the commercial application of technologies provides early involvement in projects that use our range of engineering, procurement and construction capabilities. We develop, design, commercialize and integrate a wide range of technologies to complement and expand our onshore offerings, often with the support of research centers in the USA and Europe.

T.EN is experienced in the commercial application of breakthrough technologies. This offers clients the advantage of an extensive portfolio that can make a real difference in their project economics.

When involved early, we can leverage this technology from the design phase and optimize engineering, procurement and construction, while delivering maximum profitability.

Our dedicated experts look after our wholly owned and jointly owned technologies, along with others offered from third-party licensors.

OUR FOCUS

Our principal products and technologies focus on the following areas:

- Ethylene production
- Hydrogen production
- Refining and Fluidized Catalytic Cracking
- Petrochemicals and polymers
- Fertilizers
- Gas Monetization
- Sustainable Chemistry
- Decarbonization

Ethylene

Our experience list includes 150 grassroot plants and a large number of modernization projects worldwide.

Since 2000, we have licensed about 50% of the world's total added capacity of ethylene. T.EN has unique experience in the design and construction of the largest ethylene plants, up to 2,000 kta, using proprietary technologies. We design steam crackers from concept to construction and commissioning, including key references such as Dow LHC9 (USA), the world's largest steam cracker; Sadara (KSA), the world largest mixed cracker; Reliance (India), the world's largest refinery off gases cracker and CPChem (USA), one of the largest and most energy efficient crackers in the world.

We are also the leader in modernizing existing ethylene units across the world, which is attractive to companies looking to take advantage of additional low-cost feedstocks or advantaged feedstocks such as ethane or propane. Our project portfolio includes 150 grassroot plants and more than 1,000 cracking furnaces in operation worldwide, including debottlenecking projects designed to add capacity or reduce energy consumption.

Since 1997, we have had a global alliance with the Dow Chemical Company, based on our proprietary ethylene pyrolysis furnace technology. This technology allows processing of olefins at low energy consumption with a particularly low environmental impact.

Continuous innovation

For over 60 years, our technology developments have improved energy efficiency in ethylene plants and at the same time reduced the total installation cost per ton of ethylene. Our progressive separation technologies, which reduce energy consumption and lower CO_2 emissions, are available for all types of acetylene separation processes. During the last 20 years we achieved a 30 percent reduction of CO_2 emissions by improving thermal efficiency of the furnaces, and by reducing the required compression power.

Chevron Phillips Chemical Company (CPChem), Cedar Bayou (Texas, USA)

Proprietary technologies

Thanks to a variety of associated proprietary technologies, T.EN offers ethylene producers the ability to meet tough production challenges, reduce capital costs of new furnaces and improve operational efficiency of existing furnaces. Examples:

- SMK™ and Ultra Selective Conversion (USC®) M-coils to achieve large capacities at a low cost
- Swirl Flow Tube (SFT®) which enables improved thermal exchange to improve performance
- SPYRO®, our furnace design, simulation, and optimization software tool
- Ripple Tray™ technology used in fouling services or to increase production capacity
- Hummingbird® technology converts ethanol to ethylene through dehydration
- Low-Emission Furnace with a modified heat recovery scheme that lowers CO_2 emission and fuel consumption by 30 percent

As a market leader in licensing ethylene plants, we are committed to taking our leadership further by driving continuous innovation and targeting environmental, economic and social benefits.

Hydrogen

Proven reliability and availability in hydrogen plants

We are a market leader in Hydrogen, having provided our proprietary steam reforming technology for over 50 years in more than 275 production plants worldwide, representing a market share of over 35 percent.

Hydrogen is the most widely used industrial gas in the refining, chemical and petrochemical industries, with a major share used to produce clean transport fuels complying with today's stringent environmental standards.

T.EN offers well-known, proven technology for the energy industry's hydrogen needs, tailored to specific client requirements. We provide a diverse scope of work and contracts, ranging from process design packages to lump sum turnkey projects involving engineering, procurement, construction and startup.

Our plants are fully integrated with surrounding production facilities regarding off-take of feedstock and utilities and delivery of hydrogen product and export steam. We are experts in the design of feedstock flexible plants, using refinery off-gasses, natural gas, LPG or naphtha as stand-along feed or in combination with each other.

Our grassroot units have wide capacity ranges of 1,000 to 250,000 Nm^3/h in cost-effective single train and beyond. We can increase capacity of existing plants by up to 30 percent and provide maintenance and performance optimization services for running units.

Since 1992, T.EN has had an alliance with the industrial gases producer, Air Products, realizing more than 35 hydrogen plants supplying more than 2.9 million NM^3/h (2,600 mmscfd) of hydrogen.

PROPRIETARY TOOLS

Among our innovative solutions and proprietary tools are:

- Our proprietary Hydrogen Network Design Tool (HyNDT™) which optimizes refinery hydrogen networks for improved performance and cost efficiency
- TPR®, our proprietary convective recuperative heat exchange reformer designed to optimize high-grade heat cycle and increase reforming capacity
- LSV® our ultra low-NOx burner technology
- Our proprietary Dual Chamber Process Gas Boiler enhances cost effectiveness and improves energy efficiency through extended heat recovery. Its design includes two chambers separated by an intermediate compartment with an external bypass assembly to control the exit temperature
- The Enhanced Annular Reforming Tube for Hydrogen (EARTH®) saves 30 percent on fuel costs and reduces CO2 emissions by 10 percent.

In terms of blue hydrogen, T.EN is a global leader in developing carbon capture and conditioning, having provided reformer technology to more than 270 plants in the world, used for high thermal efficiency and low carbon emissions.

Refining

The leading engineering and construction company for the global refining industry.

From conceptual design to turnkey delivery, Technip Energies manages all aspects of refining projects and integrated petrochemical complexes worldwide. With a strong track record in refinery optimization projects, T.EN has gained experience and competence in all the technological fields that impact any future development in oil refining. Our experience includes:

- More than 60 years working in the industry
- 30 world-class refineries built worldwide
- 100 major expansion or revamping projects
- 850 process units built

Our key industrial references include the Dung Quat refinery in Vietnam, the Jubail refinery in Saudi Arabia, the expansion of Burgas, the largest oil refinery in the Balkans, the integrated refinery and petrochemical complex of Rapid in Malaysia, and BAPCO, a refinery expansion project in Bahrain, and the BLADE refinery expansion in Beaumont, Texas.

Burgas refinery (Bulgaria)

Refining technologies

Technip Energies licenses refining technologies such as catalytic cracking and hydrogen. In addition, through close collaboration with other international licensors we offer strong expertise in refining modeling and process including the integration with petrochemicals. We can help you select the best technologies to meet your specific project needs. Based on our position as a leading licensor of ethylene and petrochemical technologies, we can facilitate the integration of your refining project with petrochemicals.

Badger BenzOUT™ technology

Our benzene reduction technology, BenzOUT™, converts benzene in a reformate stream while increasing octane and improving refinery economics.

Fluid Catalytic Cracking

Fluid Catalytic Cracking (FCC) is an established conversion technology that provides feedstock and product flexibility for refiners. Technip Energies is a world leader in the application of FCC technology to refinery operations.

Our success is due to advances in FCC technology made possible through our longstanding alliance with Axens, IFPEN and Total. To date, we have licensed over 60 grassroots units and executed more than 250 revamps. The alliance offers state-of-the-art advancements through:

A continually-developing database on processing a range of feeds

- **World-class research and development capabilities of IFPEN with unparalleled test facilities**
- **Direct operating experience obtained by means of collaboration with Total at its worldwide FCC facilities**
- **Comprehensive engineering design studies, pilot plant testing, test programs on commercial units, cold-flow modeling and the use of up-to-date refinery computer optimization**

Technip Energies has provided technological advances to the industry in residue processing, allowing for more flexibility in product slate to produce transportation fuels and petrochemicals.

Our latest technology is the PropyleneMAX™ (PMcc™) advanced high propylene fluidized catalytic cracking process, for selectively cracking a variety of hydrocarbon feedstocks to light olefins, particularly propylene, isobutylene, aromatic naphtha and ethylene.

In addition to licensing FCC units, we also offer FCC revamp services. Existing FCC assets can increase profitability and reliability by upgrading to newer technology. Our FCC revamp project services include:

- **Planning studies with yield and cost estimates**
- **Process computational fluid dynamics (CFD) and kinetic modeling**
- **Finite element analysis (FEA)**
- **Troubleshooting**
- **Catalyst circulation and fluidization improvement**
- **Erosion mitigation**
- **Reliability analysis**
- **Basic engineering and license**
- **Detailed mechanical design**
- **Proprietary equipment supply**
- **Inspection services**
- **Operator training**
- **Commissioning and start-up assistance**

Fluid Catalyic Cracker, Irving Oil (Canada)

Petrochemicals & Polymers

Premier proprietary technologies and strong licensing partnerships including PET, PBT, PTT, PA6, PA6.6, and specialty polymers.

Our petrochemical technology portfolio encompasses processes to manufacture a wide range of products derived from aromatics, olefins, styrenics and phenolics. With our deep experience in polymer processes, we are a leader in the field.

Technip Energies is a leader in process design, licensing and construction of petrochemical units, including basic chemicals, intermediate and derivative plants. Our services range from development from conceptual studies to full engineering, procurement and construction (EPC) of complexes based on dozens of technologies, proprietary or via license agreements.

Our proprietary technologies include:

- **Badger Process Technology**
  Badger offers premier proprietary technologies in the styrenics and phenolics petrochemical chains. Badger first started licensing technologies in the styrenics chain over 50 years ago in partnership with major industry producers. The technology portfolio expanded from that platform to include the additional alkylation-based technologies designed to make cumene and to remove benzene from motor gas (BenzOUT™ technology), as well as technology to make the important cumene derivative bisphenol A.
- **Zimmer® polymer technologies**
  For more than 60 years, Zimmer has delivered maximum resource efficiency, high availability and low operating costs to polyester and polyamide plants. Many leading polymer producers around the world have used proven Zimmer polymerization technology to manufacture high quality PET (polyester), PA (nylon) and engineering resins. Maintaining a base in Frankfurt, Germany where Zimmer was originally founded, we operate a pilot facility in Frankfurt, where R&D work is performed on general plant concepts, process efficiency, capacity adaption and final product recipes.

We also license a comprehensive portfolio of chemical technologies from leading manufacturing and technology providers, through established alliances and partnerships.

Proprietary technologies & alliances

Badger Process Technology:

- Ethylbenzene
- Styrene Monomer
- Cumene
- Bisphenol A (BPA)
- Isopropyl Alcohol
- BenzOUT™

Zimmer® polymer technologies:

- Polyesters
- Polyamides
- Specialty & bio-polymers

Other technology alliances

- Purified terephthalic acid (PTA) with BP
- Acetic acid with BP
- HCl oxidation with Sumitomo Chemicals
- Acrylonitrile with Clariant
- Acrylonitrile butadiene styrene (ABS) with SABIC
- Low density polyethylene (LDPE) production with SABIC
- General purpose polystyrene (GPPS)/high impact polystyrene (HIPS) technology with Total
- Suspension polyvinyl chloride (S-PVC) technology with KEM ONE
- Ethylene di-chloride (EDC) and vinyl chloride monomer (VCM) technologies with OxyVinyls
- HS Bleach with Arkema
- Polyolefins (polyethylene, high density polyethylene [HDPE], polypropylene [PP])
- Chlor-Alkali for membrane cell process technology

Sustainable Chemistry and Decarbonization

Engineering solutions and leading-edge technologies for the global energy transition needs.

Technip Energies offers technologies focused on energy transition including sustainable chemistry solutions and decarbonization.

We anticipate our clients' requirements, commitments and expectations, fostering technologies and engineering solutions that meet future energy scenarios and promote a circular economy.

Sustainable Chemistry

Sustaniable Green Chemicals

Our portfolio of proprietary sustainable chemical technologies includes a broad range of monomers, polymers and processes that are available individually or bundled into a single licensing package. Reference plants are provided to demonstrate their effectiveness and commercialized use.

PROPRIETARY TECHNOLOGIES:

- 1G Ethanol technology
- Hummingbird® technology: ethanol to ethylene
- Epicerol® technology: glycerol to epichlorohydrin
- Bio-based/bio-degradable plastics based on proprietary Zimmer® technologies like PBAT, PBS and PTT

TECHNOLOGY COOPERATIONS:

- Cooperation with Carbios to recycle PET
- Cooperation with Agilyx to produce recycled styrene
- Cooperation with Futerro and Sulzer for commercialization of integrated lactic acid and polylactic acid plants (PLAnet™)

Benefitting from our wide technology portfolio and our unique experience of PDP elaboration for licensors, Technip Energies can provide services to strengthen and scale up the process as well as the engineering and construction steps.

We offer the following types of services:

- **Laboratory testing and scale up in either or Frankfurt, Germany or Weymouth, MA, USA labs**
- **Feasibility studies**
- **Assistance for industrialization including value optimization and integration**
- **Process Design Package development**
- **Basic engineering and FEED studies**
- **Engineering, Procurement and Construction (EPC) and EPC Management**

Decarbonization

In 2013, Technip Energies and Shell forged a strategic alliance to market CCS projects globally, combining our Engineering, Procurement and Construction expertise with Shell's CO_2 capture technology. In addition, we have:

- A technology agreement with Petronas Carigali Sdn Bhd for the development of the K5 field in Malaysia
- Oxyfuel technology
- Agreement with Geogreen, an international services company specialized in CO_2 transport and storage

Higher efficiency for steam reformers with EARTH® Technology

The Enhanced Annular Reforming Tube for Hydrogen (EARTH®) and syngas production is a drop-in insert consisting of a structured reforming catalyst and concentric flow tubes, installed in existing or new reformer tubes, to simultaneously achieve higher throughput and heat recovery in steam reformers. EARTH® saves 30 percent on fuel costs and reduces CO_2 emissions by 10 percent.

Fertilizers

Covering the entire value chain from mining to fertilizers, including ammonia, urea and phosphoric acid plants

Technip Energies has engineered and delivered more than 400 large fertilizer complexes or integrated units in some 40 countries. Our expertise covers the entire value chain from mining to fertilizers.

We offer a full range of services from technical consulting and feasibility studies to complete turnkey facilities and global strategic plans. We implement our own processes as well as leading proprietary or licensed technologies to produce fertilizing products including acids, single nutrients and multi-component fertilizers.

We own processes through Krebs-Speichim and offer Dorr-Oliver leading technologies.

TYPES OF PLANTS SERVED:

- Geology and mining
- Sulfuric acid
- Phosphoric acid
- Phosphate fertilizers
- Ammonia/urea

Dorr-Oliver plant

We offer a constantly expanding portfolio of proprietary and licensed process technologies.

Proprietary technologies

Phosphoric acid: With over 70 reaction and filtration units installed in 28 different countries, we offer 3 technologies for the production of phosphoric acid:

- Single reactor process: The traditional technology based on process, with a single large reactor.
- DIPLO process: Using two reactors in series to optimize reaction/ filtration performance, especially for reactive rocks.

LCFC (Large Capacity Flash Cooled reaction system): Using two reactors in series, maturation tank and flash cooler, the process is designed for large capacity units, and offers high operation factor and great flexibility.

Krebs Mixer-Settler technology: Successfully operated in solvents extraction and purification units in the chemical and metallurgical industries.

Dorr-Oliver FluoSolids®: The leading technology for phosphate rock calcination processes. It can be applied in ore beneficiation, organic and cadmium removal.

UCEGO® filter: Designed to process phosphogypsum slurry for the industrial production of phosphoric acid. This filter is owned, perfected and marketed by T.EN and exclusively manufactured by ANDRITZ. With over 90 filters sold in 28 countries, the technology represents over 20 percent of the world's production of phosphoric acid. The

Gas Monetization

Technip Energies has been involved in gas monetization projects from its creation more than six decades ago. In LNG we have the longest history of any engineering contractor and have been closely associated with many of the innovations in natural gas liquefaction process technology. Today we maintain close relationships with technology licensors in gas processing and natural gas liquefaction. In LNG we offer Air Products technology unless our customers have another preference.

We offer process technologies to third parties in gas-to-liquids (GTL) and natural gas liquids (NGL).

Gas to liquids (GTL)

We offer Sasol's slurry phase distillate technology where since 2013 we have been providing FEED services for Sasol GTL projects, confirming decades of previous collaboration including the Oryx project in Qatar.

We design and manage FT reactor improvements for Sasol GTL units, and help develop environmental protection measures, including NOx and SOx emission reduction measures and waste water treatment.

Technip Energies is one of the few experienced contractors capable of managing mega-size projects and delivering large GTL facilities while in the FT section we have provided designs for more than 60 percent of the commercial Coal to Liquids (CTL) and GTL capacity worldwide.

Natural gas liquids (NGL)

For more than five decades, the development and inclusion of cryogenic NGL recovery processes in large gas treatment plants has been one of Technip Energies's hallmarks. Our process designs provide energy-efficient and cost-optimized solutions for a wide range of gas processing requirements. We offer CRYOMAX® processes which achieve high NGL recovery rates and reduce the investment cost per ton of ethane or propane as compared to conventional expander plants.

Our research laboratories

Weymouth lab (Massachusetts, USA)

This research center supports the diverse Badger and Technip Energies technology portfolio and performs an array of R&D programs for third parties. A core expertise of the lab is the developments and testing of new technologies/catalysts used in petrochemical, renewable and specialty chemical applications. The laboratory has nine fully automated pilot plants that test catalysts, determine kinetics and gather design data needed to scale up processes for commercialization.

Working on a small scale, we design, build, and operate bench and pilot-scale plants. Experiments are designed and run over many months to generate the critical design data needed to cost-effectively scale-up a process to commercial conditions. Scale-up factors in excess of one million to one have been achieved in a variety of process applications.

RANGE OF SERVICES

- First-of-a-kind process development and optimization
- Execution of bench-scale and pilot-plant programs
- Performing catalyst evaluations
- Applied catalyst design and development
- Conceptual process design and simulation
- Support of technical and economic evaluations
- Physical property and VLE determination
- Determination of reactor and unit operation type
- Metallurgical evaluations
- Development of advanced analytical methods

Zimmer lab (Frankfurt, Germany)

This research center develops and improves our polymer technologies and supports clients to commercialize their polymer products. Experiments in the lab generate the critical design data to cost effectively scale up the process to commercial conditions. Materials produced are evaluated by Zimmer's advanced analytical results to check the viability of the process for commercialization.

RANGE OF SERVICES

- Conceptual process design
- Design of experiments
- Technical and economic evaluation
- Kinetics study and reactor design
- Unit operations
- Process modeling
- Bench-scale and pilot-plant program
- Analytical laboratories
  - Chromatography
  - Chemical analysis
  - Physical-chemical analysis

Our operating centers

Technip Energies Process Technology has nine locations globally, with six operating centers and three extensions.

PT Headquarters

(Houston, Texas, USA)

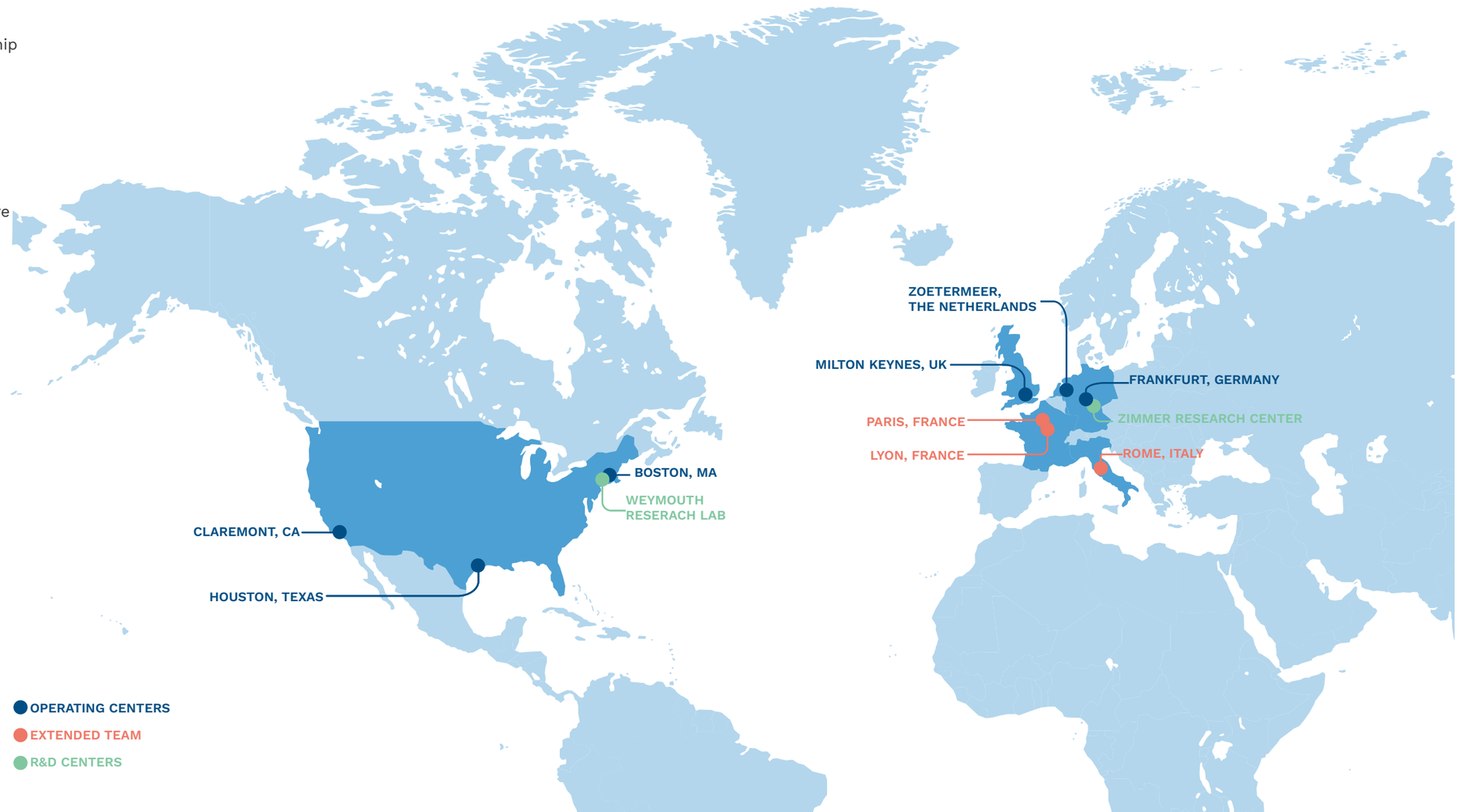
Houston is the global headquarters for Technip Energies's Process Technology business. We are a global technology licensing business that combines leading proprietary process technologies from Technip Energies, Stone & Webster, Badger and Zimmer. We have over 1,200 employees globally.

As a global network of centers, we manage the company's expanding portfolio of onshore process technologies.

~1200
EMPLOYEES

9
LOCATIONS

2
RESEARCH CENTERS



Houston, Texas (USA)

As a full-service operation, this office provides global technology licensing through engineering, procurement and construction (EPC) ser vices throughout the Americas.

- Houston is our largest center in terms of employees. Located in the Energy Corridor off Interstate I-10, we are conveniently located close to the large number of energy companies headquartered here, as well as the multitude of refineries and petrochemical complexes along the Gulf Coast.

Technologies offered include:

- **Ethylene** – The Houston office is rooted in the history of Stone & Webster process technology which has a leading reputation for its patented processes, designs and products. We have worked on many ethylene projects globally, including grassroots plants, revamps and mega-units with capacities of more than 1,500 KTA.
- **Fluid Catalytic Cracking (FCC)** – Our FCC technology, developed jointly with Axens, IFPEN, and Total, offers refiners superior operating performance, increased profitability, and considerable feedstock and product flexibility. To date, we have licensed over 60 grassroot units and performed more than 250 revamp projects.
- **Gas monetization and LNG** – This center offers LNG plant design, technological Solutions, and is an EPC contractor – whether as partner or JV leader. Most recently, we have been instrumental in expanding our mid-scale engineering, procurement and fabrication capabilities using Air Products' AP-SMR™ and AP-DMR™ LNG processes. These modular designs apply to LNG trains with capacities ranging from 1 to 3 Mtpa and offer greater certainty of cost and schedule.

Claremont, California (USA)

Our Claremont office, near Los Angeles is a full-service center, providing technology licensing through EPC. Claremont works with most of our key technologies, including:

- **Hydrogen** – Since 1992, Technip Energies and Air Products have cooperated in an alliance to supply outsourced "over-the-fence" hydrogen to the global refining industry. We provide the design and construction expertise for steam reformers and Air Products provides the gas separation technology. Both companies bring effective operational and engineering knowledge into the design for high reliability and efficiency. The alliance is responsible for more than 35 hydrogen plants supplying more than 2,600 MMSCFD (2,900,000 Nm3/h) of hydrogen.
- **Ethylene** – Claremont was the initiator of the Dow/Technip Energies alliance on cracking furnaces, with almost 40 furnaces sold to Dow since the creation of the alliance in 1997. Claremont completed the FEED for four grassroots plants for Dow in less than 10 years.
- **Dorr-Oliver FluoSolids®** – This technology makes Technip Energies a leading provider of fluid bed systems, with nearly 1,000 reference projects. The technology has a wide range of applications in the metallurgical, chemical and waste processing industries.
- **Renewables** – This center also supports many of our renewable technologies including the Hummingbird ethanol to ethylene system.

Boston, Massachusetts (USA)

In combination with our Weymouth research center, we also have a Process Technology group in Boston. This highly-experienced, full-service technology and engineering center is home to our Badger technologies, which includes license technologies for styrene, ethylbenzene, cumene, BenzOUT™ and BPA. Technologies for HCl oxidation, polystyrene and ABS are also licensed and supported by this office. This center also focuses on:

- Engineering services for Process Design Packages (PDP)
- Technology development projects, including economic feasibility studies, first-of-a-kind technology commercialization, and the evaluation of emerging technologies
- Our alliance with Sasol for the design/development of Fischer Tropsch technologies
- Fluid bed reactor technologies
- High temperature equipment and piping systems
- CFD, FEA and End-of-life evaluations
- Multi-discipline engineering; design and procurement of proprietary equipment

Milton Keynes, UK

Our UK office is based in Milton Keynes, located northwest of London. As a full-service center, this office executes the complete scope of projects from process studies, technology licensing to EPC projects, and leads our efforts in many of our renewable technologies.

Technologies offered include:

- Ethylene
- Refining
- Petrochemicals and polymers
- Renewables
  - Carbon Capture and Sequestration (CCS)
  - Ethanol to ethylene using our Hummingbird technology

Our global Ethylene technology practice is headquartered here.

This center executes projects throughout Europe, the Middle East, China, India and the FSU countries.

Frankfurt, Germany

This center is home to the Zimmer polymer technologies which includes processing of polyesters and polyamides. The Zimmer polymer technology portfolio and the team's 70 years of experience in the industry help make us a leading provider of downstream technologies, including petrochemicals and renewables. Some of the specific, proprietary polymers in the portfolio include:

- Polyesters (PET, PBT, PTT)
- Polyamides (PA6, PA6.6)
- PCT (Polycyclohexylene dimethyleneterephthalate)
- PEN (Polyethylene naphthalate)
- Biopolymers (PBAT, PBS)
- Monomers (1,3-PDO)

Our nearby Zimmer laboratory which is a research center that works on improvements to our polymer technologies and supports clients to commercialize their polymer products. (Page 17)

Zoetermeer, The Netherlands

As a full-service Process Technology center serving global markets, Zoetermeer offers proprietary technologies and know-how in ethylene and hydrogen/syngas production plants.

Our global hydrogen technology is headquartered in this PT center.

The center's portfolio includes:

- Proprietary ethylene technology for furnaces and own innovative coils e.g. SMK, GK5, GK6, triple-lane, etc.
- Proprietary hydrogen/syngas technology for reformers and full hydrogen/syngas plants
- EPC project execution
- Revamp/modernization projects in ethylene and hydrogen/syngas field
- Renewable EPC projects with exclusively licensed technology for biomass to fast pyrolysis oil plants
- Heaters in e.g. refineries and EDC plants
- Operational services
- Proprietary SPYRO simulation software

Rome, Paris and Lyon

Our process technology group is supported by engineering centers in Rome, Paris and Lyon.

In these centers, we deliver a wide range of services starting from licensing, conceptual master plans, and pre-feasibility studies to full EPC projects. These centers offer:

- Proprietary ethylene technology for olefins cryogenic recovery
- Glycerol to epichlorohydrin Epicerol® proprietary technology
- Our Cryomax® proprietary NGL cryogenic recovery technology from methane
- Phosphoric acid proprietary technology
- The Center of excellence for LNG through longstanding relationships with technology owners such Air Products (APCI) with which we have improved the process performance through numerous developments and projects. We also offer enhanced exchange tubes solutions for heat exchangers developed with Wieland and Diesta air coolers in cooperation with Wieland and Kelvion
- Support for licensing and development to technology providers according to different collaboration schemes. From License Support Agreements that provide all the engineering work for PDPs to the setup of License Cooperation Agreements/Alliances, we promote and perform technology licenses worldwide. Some of our alliances include:
  - Tubular LDPE / Sabic
  - PTA / BP
  - Acetic Acid / BP
  - PLAnet™ (sugars to PolyLactic Acid)/ Futerro and Sulzer
- Our centers provide high value services in the field of refining, petrochemicals, gas monetization, fertilizers that help our clients in the decision process of project definition and development. We perform master planning and consulting services to determine the best configuration for future plants or expansion and assess the associated costs. We can also provide economic studies to assess project profitability

During execution phase of projects, the process technology team, embedded in the EMIA region, supports our EPC organization executing midstream and downstream projects.

USA

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