PROJECTS & TECHNOLOGY

The delivery of Shell’s business strategy depends on its ability to find oil and gas resources, to develop them into productive assets and to convert crude oil and natural gas into marketable products. The Projects & Technology organisation (P&T) marshals these abilities for Shell. In addition, it carries out the research and development (R&D) that leads to future improvements in these abilities. P&T also provides functional leadership in contracting and procurement as well as in safety. In total, more than 15,200 Shell people work in P&T technology centres, offices and sites around the globe.

Shell’s Prelude FLNG facility, which is under construction in South Korea.
INNOVATION AND R&D

Since 2007, we have spent more to research and develop innovative technology than any other international oil and gas company. In 2014, R&D expenses were $1,222 million, slightly down from $1,318 million in 2013 and $1,307 million in 2012.

We have a global network of technical centres located close to our main markets and production sites. In Houston, USA, in Amsterdam and Rijswijk, the Netherlands, and in Bangalore, India, our technology hubs carry out a spectrum of activities: from evolutionary developments that optimise existing technologies in an innovative way to disruptive innovations that can yield breakthroughs for the longer-term future. Elsewhere – in China, Canada, Germany, Norway, Oman and Qatar – our centres focus on the development of specific products and solutions, marketing support and providing technical assistance to regional operations.

An integrated R&D organisation drives our technology development programme forward, bringing together in-house expertise with that of external scientific, engineering and commercial partners – often involving their off-the-shelf technologies. We have collaborated in this way for decades. Our “open innovation” helps to ensure a healthy influx of new ideas and speeds the deployment of new technology to where it will do most good: in our operations.

We have established three main vehicles through which to harness the power of open innovation. They span short and long time horizons, nascent and mature technologies, immediate and future returns.

GAMECHANGER
This programme is designed to prove quickly the commercial viability of energy-related ideas by offering a combination of proof-of-concept funding and technical expertise. Founded in 1996, it has worked with more than 1,700 innovators and turned more than 100 ideas into productive reality. (More information can be found at www.shell.com/gamechanger.)

SHELL TECHNOLOGY VENTURES
This is Shell’s corporate-venturing arm. It acts as both investor and partner in companies that are developing promising technologies with a strategic fit to the demands of our businesses in the oil and gas or renewable-energy industries. (More information can be found at www.shell.com/techventures.)

SHELL TECHWORKS
The purpose of Shell TechWorks is to accelerate the deployment of proven technologies used outside our industry. Opened in 2013 in Cambridge, Massachusetts, USA, Shell TechWorks collaborates closely with universities, applied research institutes, start-ups and venture-capitalist firms. (More information can be found at www.shell.com/techworks.)

Potential projects can involve oil and gas fields, transnational pipelines, crude-oil refineries, natural-gas liquefaction trains or petrochemical plants. Teams of scientists and engineers must identify ways in which the project can be feasibly brought into reality and then select the best option for a positive final investment decision. P&T has the in-house expertise to do this in collaboration with Shell’s other businesses, often relying on the application of innovative technology delivered by Shell’s R&D programmes.

Collaboration and innovation are tempered with practicality, however. If an existing technology or engineering process works well, then making it affordable often is a matter of its widespread standardisation and replication. Wherever appropriate, front-end engineering is done by an in-house design team using a tried-and-tested design. Major items are procured and installed through framework agreements with one contractor.

P&T’s scientists and engineers also apply their expertise to create Shell’s technologically advanced fuels and lubricants, and to come up with proprietary processes for manufacturing derivative chemicals. They also supply catalysts, technology licensing and technical consultancy services to non-Shell parties. Finally, they help to develop a new generation of Shell scientists and engineers, equipping them with standardised practices and tools to pursue their profession.
PROJECT DELIVERY

P&T is responsible for delivering capital projects. Some of them are expansions of existing projects, others are built from scratch. Many of them can be huge enterprises. They may involve several years of design and engineering work, thousands of construction workers, and billions of dollars worth of materials and equipment. In the face of such complexity, we constantly seek opportunities to improve efficiency and reduce costs.

We have created a global community of project managers to improve resourcing and share best practices. The Shell Project Academy invigorates this global community with an accredited competence development programme to help our project staff deliver sustained top-quartile performance.

Thanks to these efforts, several major projects were delivered in 2014, including four Shell-operated deep-water production facilities: two for the Mars and Cardamom fields in the USA, one for the Gumusut-Kakap field in Malaysia and one for the Bonga North West field in Nigeria.

Shell won the Project Management Company of the Year award from the Association for Project Management in 2014. The award recognised our project-delivery excellence in relation to our people and their development, organisational design and employment of project management tools and processes.

CONTRACTING AND PROCUREMENT

To gain and maintain competitive advantage in the oil and gas industry, Shell must leverage its overall buying power. P&T is accountable for maximising value from Shell’s annual third-party spend of about $67 billion. So P&T helps Shell subsidiaries focus on what and how much should be bought, when, and at what price. The goal is to get maximum value out of purchases, not just the lowest cost. The Contracting and Procurement team within P&T also analyses the market to stay on top of current trends and formulate future sourcing strategies.

By funnelling its global internal demand for certain categories of goods and services through a small number of tendered contractual packages, Shell can exercise closer oversight of delivery and performance, keep tighter control on quality, and benefit from significantly lower prices. Such contract-management improvements, coupled with increasingly efficient operations and collaborative relationships with suppliers, saved Shell and its partners about $10 billion between 2010 and 2014 inclusive.

In addition to leveraging a global market, Shell finds value in working with suppliers of national or regional markets. We often introduce local companies to global companies, providing both parties with potential business opportunities and the benefits of shared experience.

P&T therefore plays a key role in connecting Shell subsidiaries with economically, environmentally and socially responsible contractors and suppliers.

SAFETY

P&T is responsible for safety not only in the design and engineering of new wells and facilities, but also in their construction. It is constantly seeking new ways to reduce safety risks in these activities and it makes sure that new technology meets or exceeds Shell’s standards.

P&T also defines the management framework for controlling the risks to health, safety, security and the environment in Shell’s operating assets. This framework is expected to be in place so as to prevent harm to people and to prevent leaks. It specifies, for example, that offshore wells must be designed with at least two independent barriers to help mitigate the risk of an uncontrolled hydrocarbon release. And it specifies the regular inspection, testing and maintenance of these barriers to ensure they meet our standards.

We continuously reinforce a “safety first” culture among our employees and contractors. We expect anyone working for us to intervene and stop work that may appear unsafe. We expect everyone working for us to comply with our 12 mandatory Life-Saving Rules. If employees break these rules, they will face disciplinary action up to and including termination of employment. If contractors break these rules, they can be removed from the worksite. In addition to our ongoing safety awareness programmes, we hold an annual global Safety Day to reinforce the role workers play in preventing incidents and injuries.
MORE THAN A CENTURY OF INNOVATION

The P&T organisation upholds Shell’s 120-year tradition of technical excellence and pioneering spirit. Industry observers have recognised our more recent efforts to make a difference at the cutting-edge of technology. Shell is regularly placed at the top of the Patent Scorecard for energy and environmental companies, and a 2014 Fortune survey named Shell among the top 10 most innovative companies in the world.

SHELL’S TECHNOLOGY TIMELINE

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