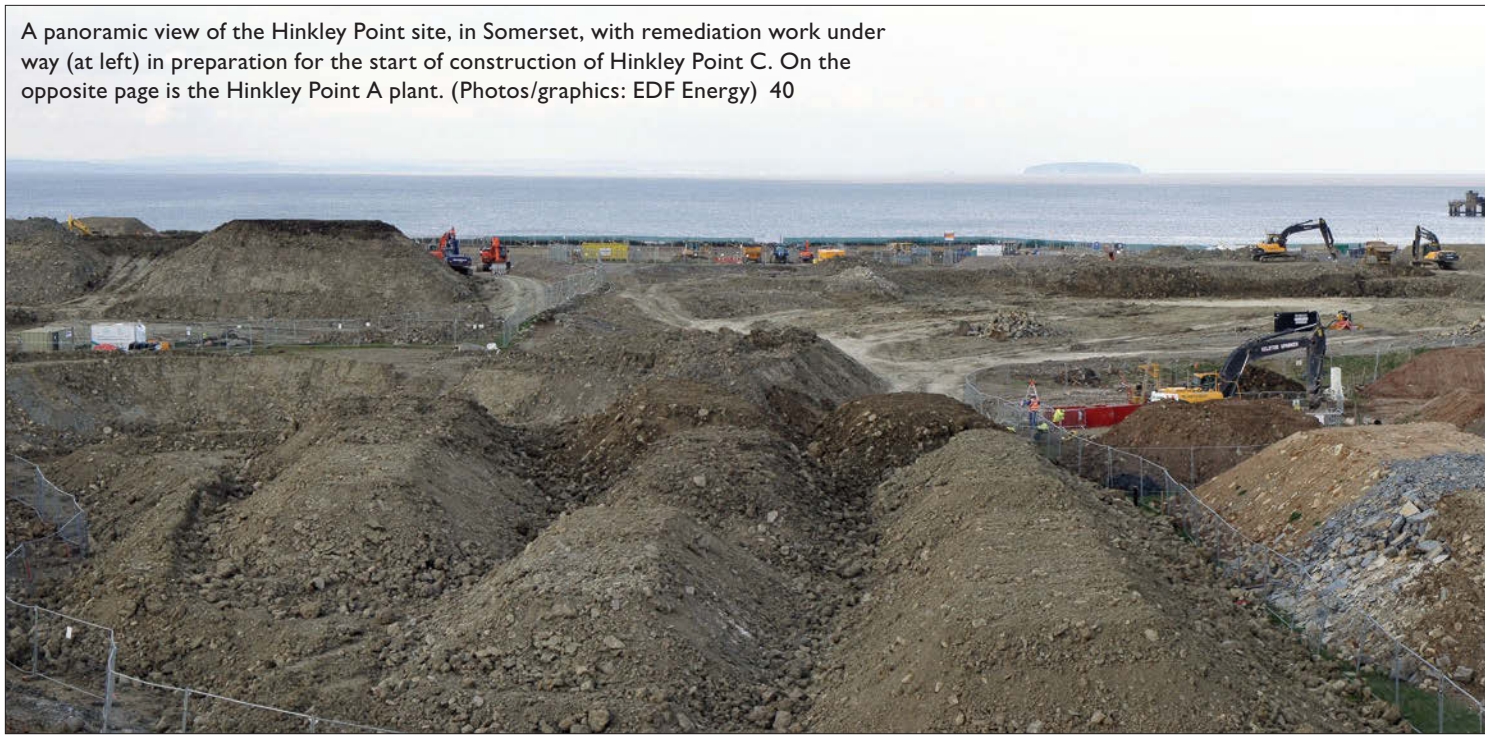


A panoramic view of the Hinkley Point site, in Somerset, with remediation work under way (at left) in preparation for the start of construction of Hinkley Point C. On the opposite page is the Hinkley Point A plant. (Photos/graphics: EDF Energy) 40

Hinkley Point C: Preparations end, full construction begins

The signing of the final contracts for EDF Energy's Hinkley Point C project on September 29, 2016, marked the start of full-on construction.

By Dick Kovan

EDF Energy, the company that operates the United Kingdom's existing nuclear power fleet, aims to deliver the Hinkley Point C project in the county of Somerset, in England's South West region, by 2025. The plant—to consist of two 1,600-MWe UK EPRs—will be the country's first nuclear new-build project since the U.K. government reopened the door to nuclear power nearly a decade ago.

The process to restart a nuclear new-build program has been lengthy and complicated. Nevertheless, the commitment made by EDF Energy and its parent company, Electricité de France, to move along that tortuous path and to succeed was always apparent, particularly in the preparations carried out at the site well before the approval process was completed. During the preapproval period, not only did the company invest in building the needed infrastructure and in developing a competent supply chain, but also in ensuring that the local Somerset communities, as well as the South West region of England, would fully benefit from the development of this once-in-a-generation opportunity. Now, everything seems to be in place for the Hinkley Point C project to succeed.

About a decade ago, nuclear power was off the political agenda in Britain, but the scale of the country's energy challenges led the government to reconsider. "We needed replacements for aging, polluting coal power stations, and for our existing nuclear reactors," a recent EDF Energy press release notes. "Putting new nuclear back into the energy mix meant the country could take action on climate change and avoid becoming over-reliant on imported gas."

With increasing support for new nuclear power stations, and following public consultations in 2006 and 2007, the government changed its energy policy in 2008. "Public opinion backed that decision," EDF Energy stated. "Since 2010, 26 power stations have closed, and more are scheduled to go off line by 2030, leaving the country with a yawning gap in its ability to generate electricity."

Given EDF Energy's background, the EPR—originally known as the European Pressurized Water Reactor—was the obvious choice of reactor technology for Hinkley Point C. The U.K. version of the design, the UK EPR, meets the country's stringent safety standards, having successfully undergone Britain's rigorous Generic Design Assessment (GDA) process. It is the only reactor design yet to have done so.

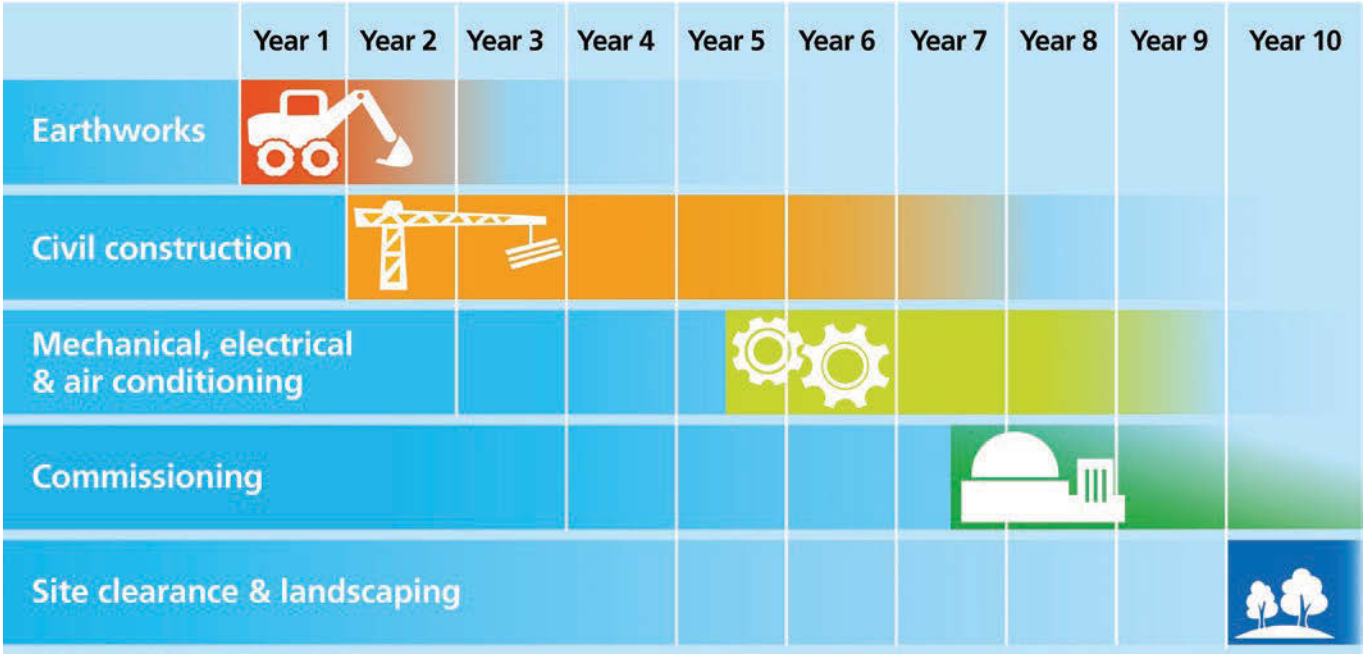
The UK EPR also benefits from the experience of the EPR projects at Flamanville in France and Taishan in China, as well as lessons learned from the Fukushima Daiichi accident. For example, a vital lesson drawn from problems experienced at Flamanville was the need, early in the

development process, for a stable reactor design. The comprehensive four-year GDA process—which included 850,000 hours of engineering studies—allowed all major regulatory issues to be addressed to ensure the stability of the EPR design.

According to Nigel Cann, Hinkley Point C's program and construction delivery director, "One of our key principles [in carrying out nuclear projects] has always been to start building only once we are fully ready, and we've now reached that point." But, he said, getting there wasn't easy. The public consultation period lasted nearly two years; the design approval process took nearly four years; and significant time was needed to secure planning permissions and envi-

A computer-generated image of the Hinkley Point C plant, which will consist of two 1,600-MWe UK EPRs.

Hinkley Point C indicative construction timeline



This timeline sets out the main activities of the 10-year Hinkley Point C project, which began with the signing of final contracts on September 29, 2016.

Cann

ronmental permits, agree to and sign contracts with the government, and obtain approval from the European Commission.

In addition, Cann said, "We've planned the construction of Hinkley Point C with the trade unions and with our contractors . . . and assembled a world-class team that has the track record we need."

The construction job at hand

Significant progress was made during the preliminary stage of the project, before the final contracts were signed, to prepare the site for the start of construction. Cann remarked that over the past few years, risks at the site have been mitigated, including issues related to ecological conditions and archeological discoveries made at the site. EDF Energy has also started building what Cann called "a small town," which will be needed to service the workforce over the life cycle of the project. About 6,000 workers will be on-site at peak times of activity.

With the signing of the final contracts, the project entered the first year of its expected 10-year duration, as shown by the Hinkley Point C Indicative Construction Timeline (above). The main activity being carried out the first year is earth excavation. Over 5 million cubic meters of earth will be dug from the north end of the site, creating excavations large enough to accommodate the power station's two units. During this initial phase of activity, work will begin on building tunnels for the station's seawater inlet and outlet structures under the Severn Estuary.

Upon completion of the excavation work, the main civil construction will begin with the pouring of concrete for the power station foundations. A seawall and a public information center will also be constructed. Ultimately, 3 million metric tons of concrete will be needed for all of the construction on the site.

To support the construction of the power station, temporary facilities, such as those needed for concrete production, are being built. The first batching plant is already manufacturing concrete for the site, and the second plant has been constructed. Ultimately, a total of four batching plants will provide all of

The photo above, taken in January 2017, shows the concrete laboratory (at left) and two concrete batching plants at the construction site.

the concrete required for the project. The majority of the aggregates needed to produce the concrete are being brought onto the site via a temporary jetty to avoid the use of tens of thousands of heavy-goods vehicles. A sea route will also be used to bring in large pieces of equipment, such as the steam generators and pressure vessels, which will be unloaded at a nearby wharf that is being refurbished.

Efforts are being made to maintain a good environment for staff and contractors, and work has begun to prepare the ground for the campuses that will provide housing during construction for key members of the workforce. The campuses will have sports fields and other leisure facilities available for personnel to use during their time off.

There will also be park-and-ride facilities for those workers who will not be staying on-site. A new roundabout referred to as the southern plaza, which will be the management point for all deliveries to the site, is now largely complete. Buses transporting the Hinkley Point C workforce to and from the site will arrive at and depart from a second new roundabout, referred to as the northern plaza. EDF Energy has been holding discussions with local communities to decide on the best bus routes and to plan the timing of construction shifts to avoid school runs and peak traffic periods.

Providing meals for workers, particularly at peak periods when thousands of people will be on-site at one time, is being handled by a joint venture called Somerset Larder. The group, consisting of six Somerset suppliers, is already in place, feeding staff and other workers every day. The joint venture is an example of efforts made to get local companies to work together to win important contracts.

Efforts are being made to maintain a good environment for staff and contractors, and work has begun to prepare the ground for the campuses that will provide housing during construction for key members of the workforce.

EDF Energy continues to work closely with local communities that have been neighbors of nuclear power plants since the 1950s to resolve site issues. That way, according to EDF Energy, "We'll deliver a site that works for our workers, that works for our neighbors, and gets the job done."

Jobs and more

With work at the Hinkley Point C site moving from the preparations phase to construction, Cann said, EDF Energy must begin delivering the first wave of high-quality jobs and apprenticeships for Somerset area residents. To help ensure that local people can access employment opportunities, the Hinkley Point C Jobs Service has been created. A partnership of EDF Energy, local jobs support organizations, and local training providers, the service has been working not only with the project, but also with other employers in the region whose businesses are expected to expand.

EDF Energy aims to recruit at least a third of the workforce locally. Jenny Sandy, employment and skills manager at Hinkley Point C, is part of the team that runs the Jobs Service. "We match local people with jobs on the project, and we've already done it for over 200 people," she said. "However, since the project is expected to create 25,000 different roles that need

to be filled over the next 10 years, we've still got some way to go." The service also helps people who want to change careers to find the right training and courses, with the goal of providing "long-term careers, not just short-term jobs," Sandy said.

EDF Energy has been engaging with the local community for several years to be certain that it understands the residents' needs and concerns and has tried to address them throughout the planning stage of the project. The company has also worked with local businesses to help them understand what they can do to support the project. EDF Energy has already placed £225-million (about $281-million) worth of contracts with local Somerset suppliers (over £435 million [about $544 million] if those awarded in the whole South West region are included) and is still exploring further opportunities for suppliers to engage with the project at every level, from the highly technical engineering aspects to the provision of services and supplies to the workforce.

EDF Energy has also invested millions of pounds with local educational institutions. The development of an energy skills center and a construction and innovations skills center at local Bridgwater College is intended to help workers upgrade their skills and to give local people an opportunity to work on the project. The company is also committed to providing 1,000 apprenticeships during the project.

The Hinkley Point C project presents a transformational opportunity for the Somerset economy. With over 2,000 companies in the local area having registered their interest in working on the plant's construction, extensive activity is under way to help local firms prepare for that work.

It is estimated that around £100 million (about $125 million) each year will be added to the region's economy during the peak construction period, and £40 million (about $50 million) each year of its planned 60-year operating life.

Also, EDF Energy has reached an agreement with local councils to deliver nearly £100 million to mitigate the impacts of construction. This includes a £20-million (about $25-million) community fund to help improve the area's socioeconomic well-being. Other economic measures are expected as well.

According to Vincent de Rivaz, chief executive officer of EDF Energy, 64 percent of spending on the project's construction will go to U.K. companies, helping to build business capabilities and a skilled workforce that can go on to other projects long after Hinkley Point C is finished. As for Somerset, its legacy will include the many benefits of 900 quality jobs when the station becomes operational and the businesses that will be able to continue to prosper beyond the construction period. NN