This is the story of the partnership that brought the Banyu Urip project to life, from discovery in 2001 to full Plan of Development production rates in 2016. It proved to be the largest oil development in Indonesia in six decades. The scale of the project—its complexity, its impact, its challenges, and, of course, its opportunities—provided a catalyst for dramatic and transformational change. The riches of Banyu Urip field have grown the wealth of Indonesia. The project area felt the benefits on every level, from improved village homes, roads and schools to training the regional workforce for productivity on a massive scale. The field will support 20 percent of Indonesia’s 2016 oil production target. The project has had a positive socio-economic impact on the country with tremendous progress at all levels. That is the mark of a transformational project. Banyu Urip’s lasting legacy will be a lasting era of successful oil production generating tremendous wealth for Indonesia and our neighboring communities.
THE PARTNERSHIP OF
BANYU URIP
OUR STORY FROM
DISCOVERY TO START-UP
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The Banyu Urip project is truly a partnership. To bring the project to life we worked hand-in-hand with many stakeholders, from the government of Indonesia, the East Java and Bojonegoro regional government, PT Pertamina EP Cepu and the Badan Kerja Sama PI Block Cepu, to our neighbors adjacent to the project. Together, we each contributed to the success of our project.

We have worked with thousands of talented Indonesians who have dedicated their efforts for the success of this project. They have shown their willingness to learn and to contribute their skills, knowledge and experience to the project.

The project is built by five Indonesian-led engineering procurement and construction (EPC) consortium companies. Together, we gained precious experience which will be useful for projects in the future. The consortium companies distributed work to other national and local companies, creating a positive multiplier effect for local economy.

What has been most exciting for me is when I see firsthand how the project has improved quality of life—our neighbors now have access to better education and better facilities. Women have access to micro loans to support the economic development of their families. Clean water runs to local homes. These examples and many more make me proud of what our partnership has achieved.

I am honored to be part of building a strong foundation for the future of Indonesia.

Daniel L. Wieczynski
President
ExxonMobil Cepu Limited
Commercialization

Participating interest signing ceremony, where 4 local government enterprises joined the Cepu Block PSC; Deddy Afidick, then Field P&GA Manager (left); Peter Coleman, LCM (3rd from left); Soekarwo, East Java Governor (6th from left); Soeyoto, Bojonegoro Regent (7th from left); Yudhi Sancoyo, Blora Regent (4th from right) Mike K. Nelson, then Project Executive (3rd from right) and Hadi Ismoyo (right).
Banyu Urip resource commercialization began in 1990 when Humpuss Patragas signed a 20-year Technical Assistance contract (TAC) with the Government of Indonesia, focused on producing from the shallow fields known to be in the Cepu area, Central Java. ExxonMobil stepped in after acquiring Ampolex shares, Humpuss partner, in 1996 after recognizing the potential and later bought the remaining 51 percent interest.

Through many negotiations and enabling agreements, Banyu Urip production started with the start-up of the Early Production Facility in 2009. This supported the government’s goal for early oil and brought revenue for reinvestment in the overall project. Production continued to ramp up over the years, reaching POD capacity in early 2016.
CREATIVELY GETTING OIL ONLINE—
EARLY PRODUCTION FACILITY, EARLY OIL EXPANSION AND WELL PAD B EARLY OIL
In the years ahead of the start-up of the pipeline, Floating Storage and Offloading Vessel, and Central Processing Facility (CPF), we were tremendously successful in bringing early production on line.

Early oil was produced from each of the three well pads. Initially, the Early Production Facility started up in 2009 to produce from Well pad A.

As the drilling program progressed ahead of plan, our engineers were successful in getting early oil production on line from Well pads B and C as well. In 2014, a proposal was made to the government to lease an early production facility for Well pad C, which was successfully installed and started up in less than five months. By late 2014, the Banyu Urip field was producing over 40,000 barrels per day.

For Well pad B, our innovative team of engineers found a creative way to reconfigure CPF flare equipment to produce over 40,000 barrels of additional oil. As a result, in 2015 the Banyu Urip field was producing over 80,000 barrels per day for months before the CPF was started up!

Our partnership made it possible.
Preparing the Community and Workforce

The Banyu Urip project literally changed the landscape of the region. A priority of project development was to ensure local communities were actively involved in the project. This partnership involved ensuring local companies and workers participated in the project through all of the phases of development, and preparing local workers with the needed training, certifications, and scholarships to support the project.

*Bersiap membangun jiwa dan raga!* [Getting ready to build our body and soul!] More than 460 national companies worked as subcontractors, with 85 percent from local villages in Bojonegoro, Tuban and Blora as well as East and Central Java regions to support the five Indonesian-led EPC consortiums. Through the procurement process familiarization initiative we engaged more than 150 local companies and cooperatives on how to become involved with Banyu Urip project.

More than 100 youths from neighboring villages in Bojonegoro, Tuban and Blora in East and Central Java were trained overseas to become our operators. They underwent on-the-job training in ExxonMobil’s global operations in the U.S., Canada, Australia, Chad and Cameroon as well as ExxonMobil operations in Aceh and Malaysia.
"Nobody gets hurt!" is the key value in our Partnership on the Banyu Urip project. Over 60 percent of our workforce had never worked in an industrial setting before, and certainly not on a major oil and gas project. Preparing workers coming from the local rice paddies and villages to understand risks and how to mitigate and manage them was a tremendous effort over the years of project execution work.

After more than 100 million work-hours—equal to 500 centuries of work!—the project safety record is among the best ever achieved in our industry. This remarkable performance was the fruit of focused training, outstanding field leadership, and the dedication of our project and drilling teams to deliver our vision of "Nobody gets hurt!"
EPC 3 Mooring Tower and EPC 4 Floating Storage and Offloading vessel Gagak Rimang.
Banyu Urip project consisted of five major contractual divisions of work to Engineer, Procure and Construct (EPC) the facilities needed to produce the field. These divisions were called EPC-1 through EPC-5.

The scope is immense—from the three well pads through the 185,000 bopd of Central Processing Facility capacity, the crude oil is transported through 95 km of onshore and offshore pipeline to the Floating Storage and Offloading (FSO) vessel Gagak Rimang. The vessel is the size of more than three soccer fields and can hold 2.2 million barrels of oil.

All of those operations are supported by the infrastructure that includes 35 buildings, a flyover road to accommodate traffic and the 740 million-gallon water supply basin the equivalent of 1,120 Olympic-sized pools.

A transformational project indeed!
Public consultation during village annual planning facilitated by the project.
Contract awards and land acquisition

In 2011, ExxonMobil awarded five major Engineering, Procurement and Construction contracts to five Indonesian-led consortium companies. These consortiums distributed work to more than 460 national and local businesses creating more multiplier effect. Alongside the bidding, land needed to be acquired for the Central Processing Facility (CPF), well pads, pipeline and water basin.

The CPF footprint is in Bojonegoro regency, while the pipeline route crossed two regencies in East Java: Tuban and Bojonegoro impacting 91 villages. The project needed to purchase more than 3,500 land plots and lease another 2,600 for construction use.

We executed our work in compliance with our Integrated Environmental Impact Assessment, which included public disclosure and acceptance from the communities.

During the progression of land acquisition, the siting of major facilities had to be revised, due to the inability to obtain land in preferred locations. Tremendous effort and conversation, negotiations, and understanding landowner concerns solved the issues—many discussions may have taken place over snacks and coffee!

It is our partners, PT Pertamina EP Cepu and BKS PI Blok Cepu, who understood the local culture best and help blend ExxonMobil’s rigorous processes into a synergy that delivered the land required to build the project.

EPC 1 contract award to Tripatra-Samsung, witnessed by R. Priyono, then Chairman of BP Migas.

Land Team Manager Deddy Afidick presents land acquisition process during public consultation in 2007.
Land owner signs paperwork to sell or rent his land.

Negotiations can take place over snacks and coffee.

There were vast rice paddies as far as the eye could see. Familiar with the plot plan of the Banyu Urip project, the partnership imagined a massive scale of the project all on the muddy-green fields.

Constructing the project facilities is one thing. Doing it safely is the most important challenge.

We are ready!
EPC-1: Central Processing Facility

Central Processing Facility in April 2015
Construction activities for Banyu Urip Full Field Development started in December 2011. The EPC-1 contract was awarded to Indonesian-led consortium Tripatra-Samsung, whose scope included the Central Processing Facility (CPF), which was built logistically central to Well pads A, B and C, where 45 wells were drilled to produce the crude oil and inject water and gas.

Natural gas, produced along with the crude oil, is used for power generation at the CPF. This is gathered with flow lines and processed by the separation equipment to remove gas and water components from the crude before its delivery through the pipeline for storage and sale. At peak construction, over 17,000 people worked on Banyu Urip EPC-1 project simultaneously.
EPC-2:
ONSHORE PIPELINE

Horizontal Directional Drilling lays pipe underneath a road, river or railway, without disrupting activities above it.

Spanning over 72 kilometers, the Banyu Urip onshore pipeline covers with a lot of ground. Fifty-eight villages were impacted by EPC-2. The construction contract was awarded to Indonesian consortium PT Inti Karya Persada Tehnik and PT Kelsri at the end of October 2011. Two Indonesian mills produced the majority of the pipe: Krakatau Steel and Indal Steel Pipe. Then, the contractor transported approximately 6,300 joints of pipe in about 1,200 truckloads to the three-laydown locations.

The project has supported the national steel industry to grow.
Pipeline is laid using cranes.
Weekly safety briefing at EPC 2 Rengel Camp.
EPC-3:
OFFSHORE PIPELINE, MOORING TOWER AND SUPPORT STRUCTURE

Sendi Putra (left).

Piles and Jacket loaded out on barge, ready for sail away, September, 2014.
EPC-3 linked the Central Processing Facilities and onshore pipeline to the Floating Storage Offloading (FSO) vessel, where stored oil is transferred to ships for domestic and international market.

The scope included: 23 kilometers of offshore pipeline, joining the onshore pipeline at Palang coast, Tuban, to the FSO location; the 3,800-ton mooring tower, including its topsides, jacket and yoke; anchoring the FSO to the seabed; and the Mooring Support Structure (MSS), installed onto the stern of the FSO and extending to link the mooring tower to the FSO.

The innovative design of the mooring tower allows the vessel to swivel 360 degrees and rise or fall with the seas in all weather conditions without interrupting the flow of oil.
EPC-4: Gagak Rimang floating storage and offloading vessel

FSO Gagak Rimang Sailed away Sembawang Shipyard

FSO Gagak Rimang and the mooring tower are connected offshore Tuban.
EPC-4’s Floating Storage and Offloading (FSO) vessel Gagak Rimang—named after Arya Jipang’s (a mythical hero in East Java) horse for its strength and reliability—is a gigantic structure. It measures 327 meters and weighs 46,500 tons or equals to more than the length of three soccer fields and the weight of 57 Jakarta’s National Monument—and it still floats.

The EPC-4 contract was signed in late 2010 with Scorpa Sembawang Consortium, whose scope of work consisted of selecting, purchasing and converting a Very Large Crude Carrier into an FSO vessel for permanent connection to an offshore Mooring Tower, supplied and installed by the EPC-3 contractor.

The tasks were split between the two partners with the majority of work to be done in Indonesia, stewarded by PT Scorpa, while the conversion work in Singapore was stewarded by Sembawang. For three consecutive years, the Workplace Safety and Health Council of Singapore awarded the construction team the prestigious Safety and Health Recognition for Projects (SHARP).
EPC-5: INFRASTRUCTURE, RAW WATER BASIN AND FLYOVER ROAD

The key aspects of EPC-5 comprised building a raw water retention basin for use by the Central Processing Facility (CPF); constructing roughly 35 administrative, operations and personnel buildings; plus a flyover road to provide unconstrained access to the site from Bojonegoro-Cepu highway while crossing a railway line.

Delivery of water was critical to an early start-up of the facility. The second accomplishment for EPC-5 was construction of an enormous earthen dam and raw water retention basin. This basin holds 740 million gallons of water, the equivalent of 1,120 Olympic-sized pools.

Oil recovery from the Banyu Urip field is maximized by water injection wells, which help maintain pressure in the reservoir and sweep the oil to the producing wells. The injected water is supplied from produced water and raw water from the Solo River during rainy season. River water is drawn by three pumps and sent through six kilometers of 24-inch pipeline to the basin.
The first exploration well on Banyu Urip was drilled with a conventional land rig, the Century-25. With three well pads containing multiple wells each, however, the standard rig would be time-consuming to assemble, drill, move and reassemble. Innovation and optimization in drilling sequences helped the group to finish the wells ahead of schedule.

That is why the first two drilling rigs built in Indonesia were utilized in the Banyu Urip drilling campaign. In 2014, the drilling team won an ExxonMobil vice president capital efficiency award for accelerating 700 days ahead of schedule and saved more than $140 million. This allowed for early oil production outside the main facility and supplementary drilling at nearby Kedung Keris field using existing drilling contracts.

The drilling program was executed safely, winning two ExxonMobil Development Company Safety Awards, ahead of schedule, and under budget.

Simply, an outstanding effort.


Discovery-8, one of the first two drilling rigs made in Indonesia.
The well heads at Well Pad B.
Preparations for Start-up—all systems go!

After completion and commissioning, Project facilities were turned over to the Start-Up Team for acceptance. Overall, Systems Completion (SC) work can be five to eight percent of a project’s total cost—a small investment, but a big number in a $4 billion project.

Anything the team identifies as being off-specification or does not function as designed is called a “discovery.” Whether the flaw is minor or major, it will impact the whole, which is why identifying issues early is critical to the success of a project. As issues are identified, the team works with construction and commissioning to manage the revision work in prioritized fashion to start up as early and safely as possible.

It is like testing a brand new car, the project has to make sure that the engine runs, the brake works and the lights come on.
Development was one of the first groups on the ground at site when the project started, being the face of the project to partners, governments, and the communities. Before the project began, the group initiated its activities by conducting integrated environmental impact assessment to identify potential issues and create plans to manage impacts to communities and environment.

The group then ramped up its activities in acquiring land required for the central processing facilities and its 72 km of onshore pipeline, while at the same time setting up field logistics base and public and government affairs office. During construction, Development oversaw environmental management, permits acquisition strategy and managed socio-economic issues. The Development group was not expected to process the permitting paperwork, but facilitated key relationships for an easier route to approvals.

Public events, including wayangan, or shadow puppet performances, provide a venue for company messages, such as Project updates.

Community socialization for Banyu Urip Development Wells at Mojodelik village on April 23, 2013
Protecting tomorrow today

One of the partnership key values is “protecting tomorrow, today: the rewards of being a good steward today provide for a better tomorrow.” Apart from meeting the necessary regulatory requirements, we took the initiative to go beyond and reduce waste generation and flaring.

From a project design standpoint, control protocols were applied to the treatment of air, water and waste for minimizing their impacts on the environment. Local values were also respected. And in many cases, the neighboring communities and Non-Governmental Organizations are an integrated part of our partnership which objective is to ramp up outreach and raise living standards.

We are a great neighbor.
Providing saplings to neighboring villages is one of the project's initiatives to protect tomorrow, today.
The fascinating history of Cepu block hit its stride with discovery of the Banyu Urip field in 2001. Hints of a potential oil field were recognized on a vintage 2-D seismic survey, but prior to drilling the discovery well, there was significant uncertainty about what might lay nearly a mile below the surface.

For the Subsurface team, which is responsible for determining how much oil is in the ground and how much of it can be produced, the first significant work began with conducting the largest 3-D land seismic survey in Indonesian history.

The results were impressive! The amount of oil at Banyu Urip was calculated to be over one billion barrels, which classified the field as a "giant"—one of only three in Indonesia. But an important question remained: how much of the oil could be economically produced? To answer this, reservoir engineers constructed detailed and complex computer simulation models to design a development plan and determine how many and what types of wells were needed to extract the oil.

The conclusion of several years of engineering and commercial analysis was that Banyu Urip field would yield an impressive 165,000 barrels per day initially and recover over 450 million barrels of reserves.
First camp in Banyu Urip’s seismic campaign.

Banyu Urip structure.
The Technical group is the keeper of economic analysis, progress updates and budget information passed to project stakeholders. The group’s flow of information moved internally within ExxonMobil and the project team and externally to partners and the government of Indonesia.

Technical group generated a steady stream of required reports. Data from many project sources was gathered and distilled for concise accounts. Technical also supported monitoring status and plans for environmental analysis, permitting, regulatory interactions and socio-economics.
Controlling costs keep a project on budget. Two drivers steer budgets for projects like Banyu Urip: project controls look through the windshield and down the road to estimate, plan, schedule, govern and forecast; controllers keep an eye in the rear view mirror, accounting for the costs while ensuring everyone on the project team follows the same strict set of corporate controls and policies.

These cost control functions phased and progressed with the project, making it challenging and stimulating. Site visits enabled personnel to see what their numbers represented in terms of the people and equipment that built the project’s many mammoth structures.
Building the Production Organization

Building the Production Organization (BTPO) job was to bridge the gap between the project and its contractors to construct a world-class facility for successful long term operations. ExxonMobil led a series of programs aimed at project teams to prepare them for these tasks.

The BTPO Program implemented at Banyu Urip established skills set to run the various phases of oil and gas functions, but it also developed the overall workforce. The BTPO Program assured that a qualified workforce was in place on Day 1 to safely and effectively operate with ExxonMobil global standards. The selection process vetted thousands of applicants to train approximately 110 technicians from the surrounding villages in Bojonegoro, Tuban and Blora in East and Central Java regions, to run the Banyu Urip facilities.

“I have learned so much from our best mentors in the U.S., Malaysia and our Aceh operations,” said Hastuti, one of the operators from Bojonegoro. “I learned from technical know-how to safety values.”
In any country, the governing of natural resources in the broadest sense entails accessing them safely and using them wisely for the benefit of all. When it came to a massive oil project in Indonesia, like Banyu Urip, with facilities, pipelines and an offshore vessel, studying the impact of every detail before it began was a must.

From the government of Indonesia side, various ministries and institution took role in assuring good governance in the project. Starting from the Forestry and Environmental Ministry that oversee environmental impact, the SKK Migas who is Indonesia’s signatory on the Production Sharing Contract and performed as the overarching regulatory presence in the Project relationship and the Energy and Mineral Resources Ministry.

We thank the government of Indonesia for their ongoing and never ending support.
Strategic community investment and outreach

It is the partnership’s commitment to develop its neighboring communities—ethically. The overarching goal was for prosperity to grow alongside Banyu Urip, with communities made independent through sustainable programs and skills gained to equip them for life ahead.

Touching the lives of more than 100,000 community members in Bojonegoro, Tuban and Blora, the community programs are focused on health, education and economic development. Thus, strategic training shifted many locals from chiefly agricultural tasks to industrial skills. Programs also expanded schooling and promoted villagers’ health. Since 2007, the social investments are more than $30 million, funding health programs, economic development and improving education.

Semai Benih Bangsa community development program benefitted the communities with an active, joyful and interactive learning.
Refurbished school adjacent to Project Area.
Mushroom farming community development program.

Women village bankers manage microloan payment program.
Building local businesses

Banyu Urip project presented a foremost opportunity for neighboring businesses and contractors. Industries with a low-entry barrier and start-up costs, such as construction, transportation and catering, could flourish through the call for domestic content.

The project sponsored training for farmer associations from 12 villages, providing expertise in organic methods for feeding plants and naturally repelling pests that improves yield. Women benefitted alongside men, the project has invested in programs that train and mentor women in technology, sales and marketing, basic accounting and comprehensive product knowledge.

More than Rp100 billions of revolving fund and loan has benefited more than 10,000 women—with almost 100 percent of those loans are paid back timely.

Women gather in the weekly meeting for training in cashflow, management, nutrition and health.
Celebrating success

The Banyu Urip project’s interdependent work divisions earned international and corporate recognition. The project celebrated with awards and commemorations throughout construction to deliver success.

First oil commenced in December 2008 with the Early Production Facility (EPF), establishing production capacity of 20,000 barrels of oil per day by August 2009. The final milestone for the offshore team was to deliver the first cargo of oil from the FSO to a crude carrier. 600,000 barrels of oil was offloaded to Pertamina’s tanker on April 13, 2015.

Now, the Banyu Urip oil production has exceeded the full Plan of Development production rate of 165,000 bopd.
The mooring tower sail away from Cilegon, Western Java to offshore Tuban, Eastern Java.
Onboard the FSO Gagak Rimang during first oil lifting.

Discovery-8 drills Banyu Urip development wells in Well Pad B. Discovery-8 and Discovery-9: the first two rigs built in Indonesia.
Capital Efficiency Award—Utilizing the first two rigs built in Indonesia, the Indonesian Drilled Team drilled an impressive 180,000 ft. and reduced days per well by 40 percent. By delivering on cost and schedule commitments, the team enabled early oil production and created savings in excess of $140 million for 2014.
March 2015, three wells at Well Pad B were brought online to ramp up production.

First Oil commenced from Well Pad A in December 2008.
A TRANSFORMATIONAL PROJECT
The Banyu Urip project proved to be the largest oil development in Indonesia across six decades. The scale of the project—its complexity, its impact, and its challenges and, of course, its opportunities—provided a catalyst for dramatic and transformational change.

With a central processing facility capacity of 185,000 barrels per day, the Banyu Urip project will recover 450 million barrels of reserves. The field promises to meet over 20 percent of Indonesia’s 2016 oil production. The project has had a positive socio-economic impact on the country with tremendous progress at all levels.

Those are the marks of a transformational project.
The Discovery 8, the first drilling rig entirely built in Indonesia is utilized during the project’s drilling campaign.

The FSO Gagak Rimang stores processed oil offshore Tuban, ready for delivery to domestic and international markets, generating wealth for Indonesia.