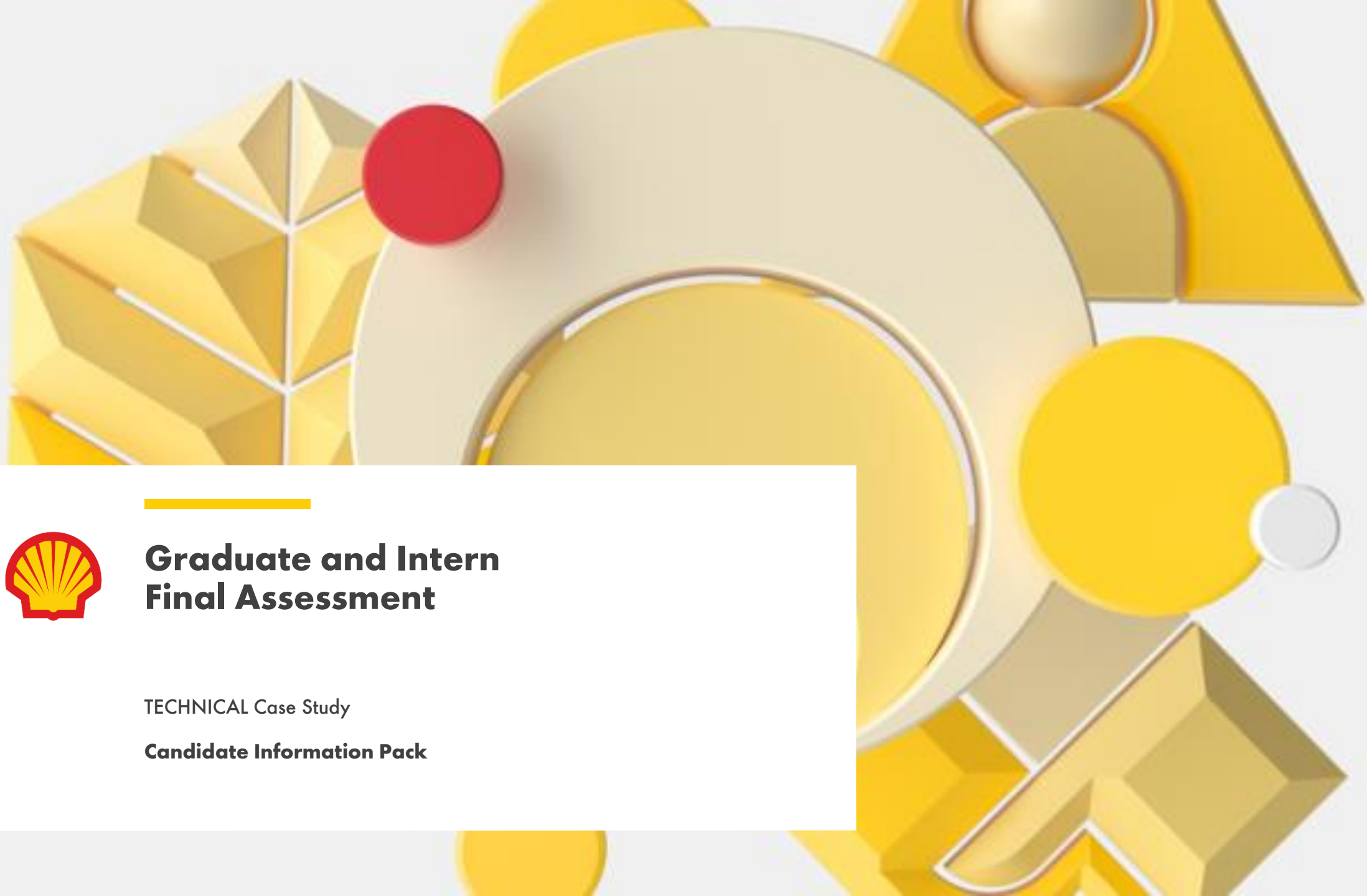


Graduate and Intern Final Assessment

TECHNICAL Case Study

Candidate Information Pack

Case Study Instructions

You have been sent this information to prepare for your video-based case study. Prior to this assessment, your **only** task is to familiarise yourself with this information pack. You will be given more instructions when you log into the MS Teams video-interviewing platform.

Please note, the exercise will NOT be an assessment of your technical knowledge. It will instead assess the way in which you analyse and use the information provided. No specialist knowledge or experience of the subject will be required to complete the exercise; you only need the information in this document. Much of the information is fictitious including some of the Shell products and services. It is designed to make you think about a combination of circumstances rather than any real businesses or activities associated to Shell or the industry today. You are not required to conduct further research. Beyond looking up definitions for terms or concepts you are unfamiliar with, such research is unlikely to be useful to you.

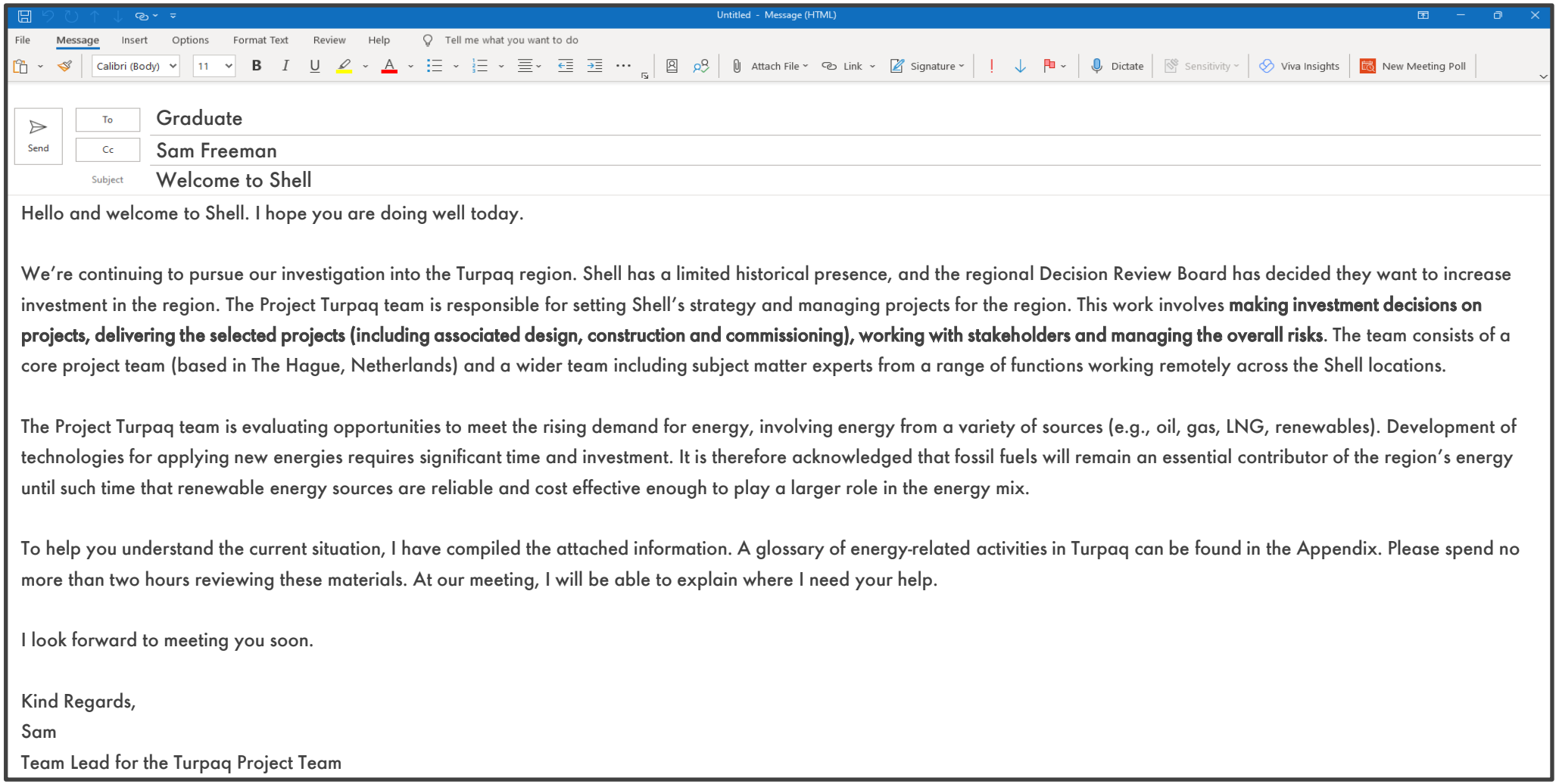
We recommend that you print these materials in color and spend a maximum of 120 minutes reviewing this document. This should be sufficient for the task you will be asked to complete.

The exercise is set within a fictional region of the world: **The Turpaq Region***. Within Turpaq there are three neighbouring countries: **Bavar, Khad and Almay**. You are a graduate working for Shell, supporting your line manager who is working in the **Turpaq Project Team**. This team consists of 210 individuals, spanning various locations in the region. Your line manager is Sam Freeman; however, you will be working with all members of the Project Team as required. For the purposes of this exercise, the year is 2026.

Disclaimer: The Turpaq region and all the associated information provided is fictitious. Any similarity to real countries, political/business climates, company names, characters, data, places, and incidents is entirely coincidental.

*The term region should be understood to mean a cluster of countries in the same area.

Welcome Email from Sam Freeman



Introduction to the Turpaq Region – Shell's Strategic Priorities

Shell's purpose is to **power progress together with more and cleaner energy solutions**. Our strategy is to deliver value for our customers, for society, for our investors and for the planet. A strategy that's based on an ambitious but achievable set of goals we call **Powering Progress**. These goals aim to deliver real value for all our stakeholders as we aim to build a strong and resilient company by putting customers at the heart of everything we do.

We will accelerate the transition to net-zero emissions purposefully and profitably by:
- Driving the decarbonisation of sectors where we will work together with customers and policy makers to accelerate the transition, sector by sector.
- Working from the customer back: helping customers transition to net-zero at a pace that works for them.
- Continuing to bring the superior value that our integrated business model offers.
- And managing our portfolio of energy solutions in a way that's dynamic and deliberate.

In October 2020, Shell introduced three business pillars – Growth, Transition and Upstream. In essence, we intend to build significant low-carbon businesses by the early 2030s – matched by a high-quality Upstream portfolio.

- In our Growth pillar, we focus on working with our customers to accelerate the transition to net-zero emissions. In Renewables and Energy Solutions, we plan to build a material Integrated Power business selling twice as much electricity by 2030 as we did in 2020. We intend to commercialise the growth potential of biofuels and hydrogen. And we expect to invest large sums to build a significant and profitable Nature-Based Solutions business to help customers meet their own net-zero emissions targets.

- In our Transition pillar, we plan to extend our leadership in Liquified Natural Gas (LNG) volumes and markets and to grow volumes of the chemicals portfolio and increase the cash it generates.

- Our Upstream pillar will continue to provide energy for today, as well as the cash to deliver value to our shareholders and fund the future transformation of Shell. The continued emphasis on value over volume will see us selectively develop core upstream positions to fund our strategy – sustainably generating cash over the coming decades, while providing vital energy supplies.

These goals are underpinned by our core values of **honesty, integrity, and respect** as well as our unwavering focus on **safety**. Our goal is to have zero fatalities and zero spills through responsible operations. This means no incidents that cause harm to our people, environment, and neighbors, or put our facilities at risk.

Map of the Turpaq Region

Mountain Range

City

Highway

Coral Reefs & Protected Area

O&G Fields in Development

B BEC

P Parabean Energy

E Energiks

Energiks New Offshore Lease

O&G Opportunities

A Apollo Field

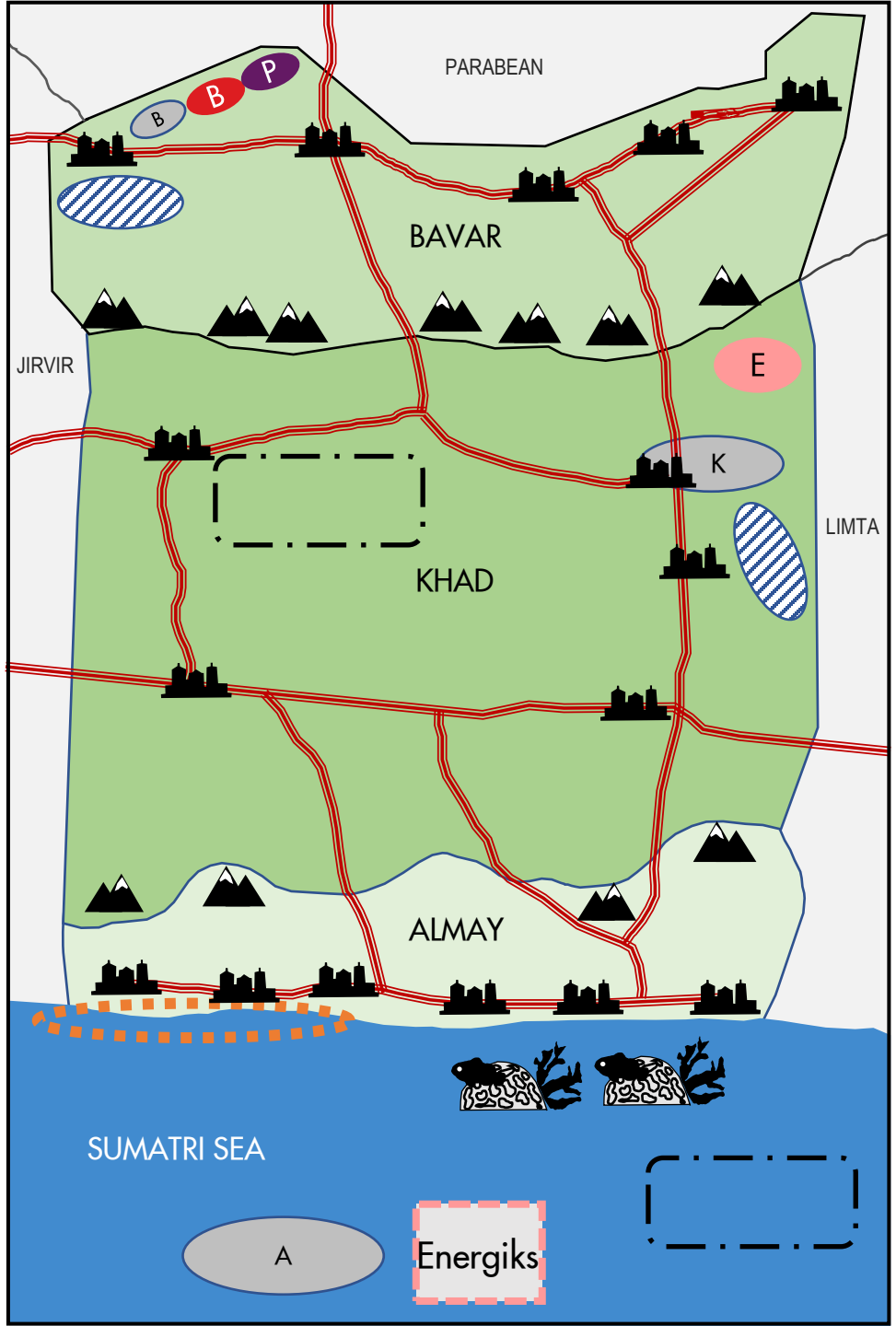
B Brontus Field

K Kratus Field

Potential CCS Target

Potential Area for LNG Plant

Potential Area for Wind Farm



Introduction to the Turpaq Region – Regional Overview

The Turpaq region is characterized by mountainous landscapes, with peaks that reach heights of up to 3,500 meters above sea level. It is a temperate climate, with occasional storms and floods.

The region has demonstrated steady economic and political progress over the last five years. The region has long benefitted from strong overground trade routes to the North, West and East, and from fishing along the Almay coastline. Exports of raw materials such as timber, coal and minerals have been traditional industries. More recently, interest has grown in the Almay coastline (and indeed the wider region for the more adventurous) as a cost-effective and unique tourist destination.

Over the last eighteen months, the region has seen significant investment in telecommunications by telecoms organisations from the wealthy and progressive Parabean, a country north of Bavar. The economic and social impact of this investment on local economies has been very positive. The Turpaq region has provided outsourced services, especially in Bavar, for Parabean organisations. This in turn has led to a broader range of employment opportunities and rejuvenated local commerce.

The local governments in Turpaq are keenly interested in increasing their energy supply to keep up with the economic development and transportation needs. They are aware that they will need to balance current needs with long-term environmental implications, including cutting CO2 emissions.

Due to declining future availability of fossil fuels, international pressures to reduce CO2 emissions, and the predicted population growth, the governments across the region are looking into alternative energy sources as well as hydrocarbon production. Exploration activities in Khad and Bavar have identified large reserves of crude oil and natural gas; however, production has only started in Khad and Bavar. Bavar Energy Company (BEC) operates a field in northern Bavar. Parabean Energy also operates a field in northern Bavar. Shell is a minority partner in the Parabean field. Energiks operates an onshore field in the northeast section of Khad. All energy currently produced at these fields is exported to the energy-hungry markets of neighbouring countries. As the Turpaq region tries to accelerate its progression towards alternative energy sources, it will be reliant on further production starting or imports from other countries.

BEC is the Bavar state-owned energy company. It is working with governments in Bavar, Almay and Khad to diversify the power mix in order toto ensure a reliable energy supply that can support the growing population. BEC works closely with government representatives to meet energy and environmental targets. Within Bavar, the company has arranged a deal to receive preferential treatment compared to other energy companies. As a result, BEC will receive tax revenue from international sales of any future resources recovered in Bavar.

The retail mobility market (gas and petrol stations) in the region is expected to grow rapidly in the next decade, as a result of economic development.

Unemployment in Almay and Khad remains high. Bavar has a predicted population increase of 4% per year over the next ten years. As a result, there is a push from the governments to support traineeships across the region.

Overview of the Turpaq Region

	Population		GDP Per Capita*		Unemployment		Main Industries		Government	
	Currently	Estimated Population Growth Rate Per Year	Last Year	Estimated Economic Growth Per Year	Currently	Estimated Change Over Next 10 Years	Industry	Estimated Growth Projections Over Next 10 Years	Type	Stability
Bavar	3,400,000 • 75% of population in mid-size cities • 25% in smaller towns and remote villages in the foothills of the Harlan Mountains	4%	$53,000	Moderate Growth	7.2%	3% Decrease	Raw materials (timber) Manufacturing Services	Slight Decline Moderate Growth Strong Growth	Democratically elected	30 years
Khad	3,750,000 • Equally spread between medium-sized cities, many mid-sized towns and a large number of small agricultural businesses	1.2%	$43,000	Strong-to-Moderate Growth	9.5%	1% Increase	Agriculture Raw materials (timber, coal, minerals) Manufacturing	Moderate Growth Static Strong Growth	Democratically elected In the past, unstable with inflexible, though peaceful dictatorships	20 years
Almay	6,150,000 • 60% of population in large cities • 40% in small/medium towns that line the coast	1.9%	$60,000	Moderate Growth	15%	2% Decrease	Fishing Outsourced Services Tourism	Static Moderate Growth Strong Growth	Democratically elected	35 years

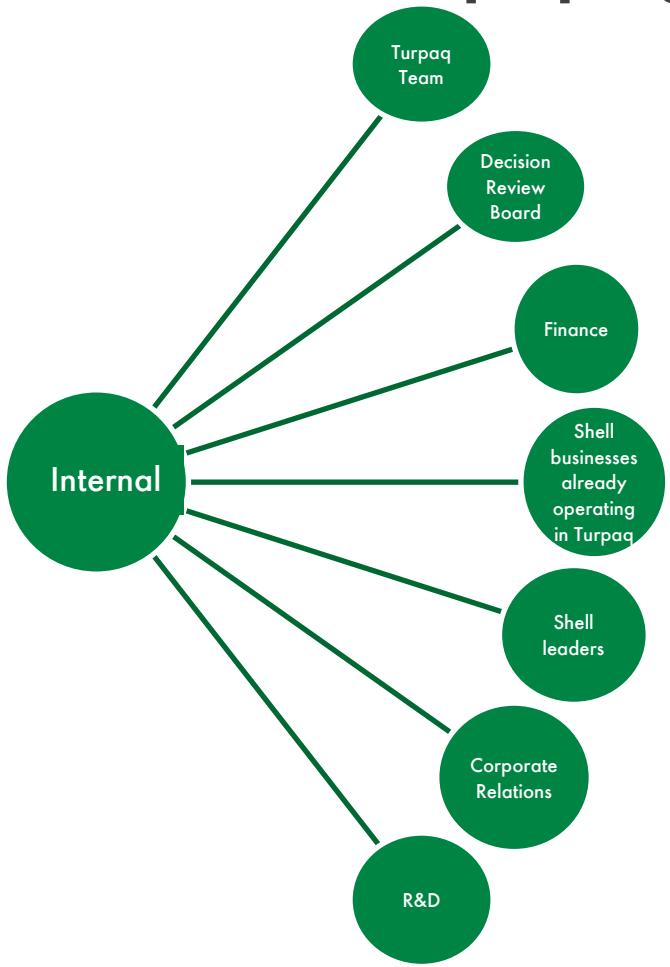
Detailed Country Reports on Bavar, Khad and Almay

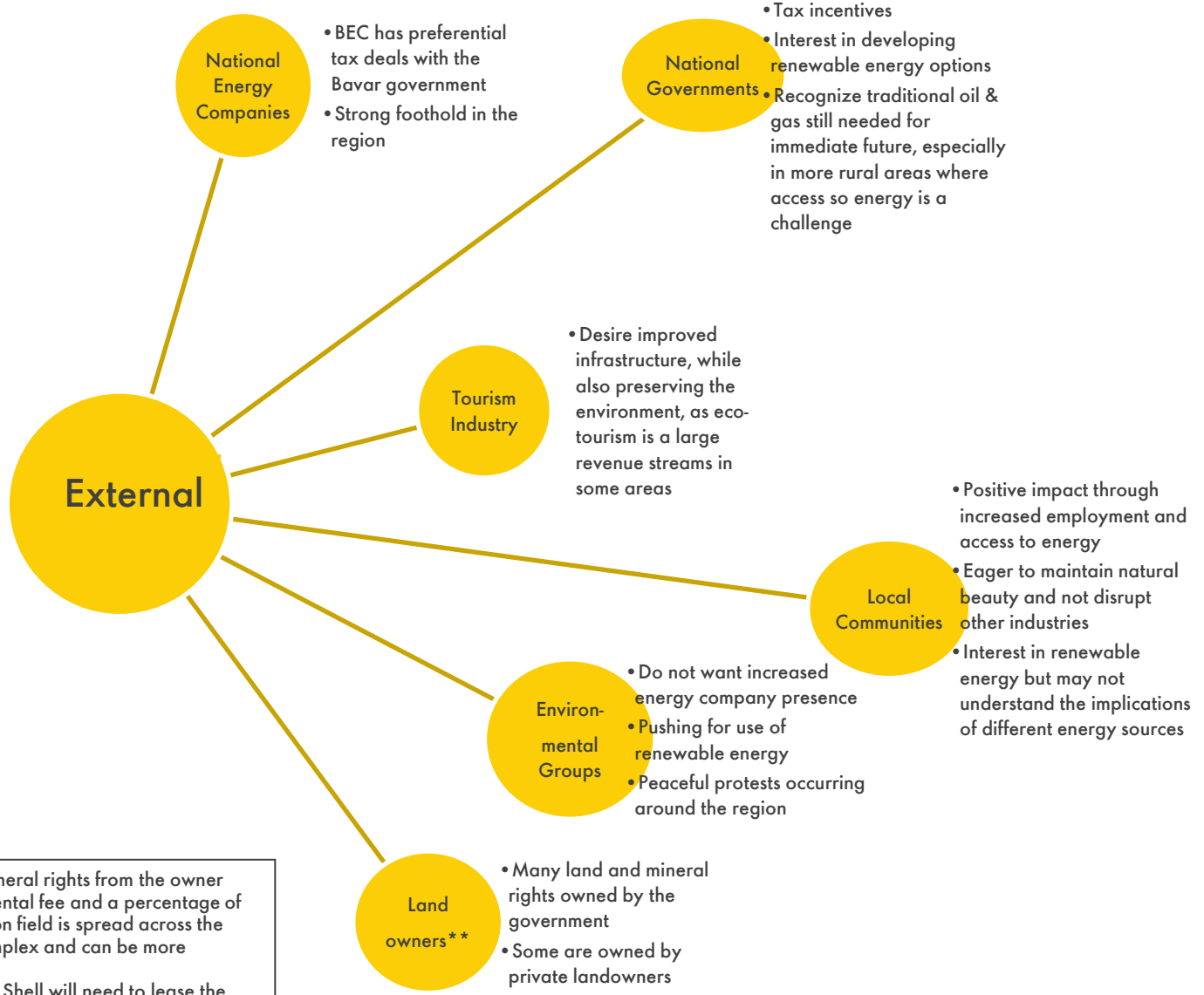
	Bavar	Khad	Almay
Government	• Upcoming election will be close; right-wing political party, Conservatol, expected to retain power but the Bavar Green Party has growing support • Traditionally welcomed investment by foreign companies by offering moderate tax incentives • Recently, a policy was approved declaring that energy companies must invest 2.5% of their profits from oil and gas sales into research and development of cleaner energy	• The Khad government has not traditionally welcomed investment by foreign companies, preferring to support nationalised services and products • However, it has become increasingly open in the last decade and there has been a small boom in external investment, particularly in manufacturing and higher-tech agriculture • The Department of Environment, Land, Water and Planning would like to provide more renewable energy throughout the region; the government is currently considering funding various projects	• Traditionally welcomed investment by foreign companies, being particularly open to those that support the tourism industry • In recent times there has been growing awareness of the value of retaining cultural heritage and traditions, and so the government has shifted back towards supporting local businesses rather foreign investors such as big multinational hotel chains
Economic Development	• Most economically developed in the region, historically • Proximity to Parabean • Key trade route from the agriculture-rich plains of Khad; critical for transporting raw materials and manufactured goods northward • Bavar Green Party is growing in popularity; they are advocating a faster transition towards the use of more renewable energy and the development that will bring to Bavar	• Economic stability from agriculture • Devastation to large swathes of farmland or cities when significant floods occur (every 5 – 10 years) • Small chemicals plant in south has seen success as surrounding areas turn to LNG and alternative fuels; this has brought more disposable income • Price of land is particularly cheap and the cost of construction materials is comparatively cheap for the region • Local companies are investing in bio-fuel development in Khad's farmlands	• Economic stability primarily due to revenue from fishing and tourism • Extended shore-line provides opportunities for shipping and trade routes outside of the region • The most environmentally conscious in the region, as eco-tourism flourishes in Almay
Weather and Geography	• Highest altitude • Most extreme weather conditions • Snow and ice storms in the Harlan Mountains	• Largest geographical footprint • Majority of country is moderate-altitude flat plains, many with rich soils suitable for a range of agriculture • Mild weather most of the year • Challenges with flooding and strong winds during the rainy season (~4 months)	• Long stretch of beautiful, natural coastline • Small mountainous ridge along border with Khad • Mild climate most of the year, with a warmer season between May and September, followed by a rainy month in October

Detailed Country Reports on Bavar, Khad and Almay

	Bavar	Khad	Almay
Main Industries	• Historically, timber and manufacturing • Growth in providing services for Parabean organizations	• Manufacturing and agriculture, due to the expanses of flat and open countryside • Manufacturing is growing as agriculture impacted through weather events • Tourism is growing slowly; typically, more adventurous who want to take in the scenery and local culture • The Khad government recognizes their geography is suitable to solar and wind and have expressed interest in such opportunities	• Fishing is still a significant industry, supplying not only Almay but also southern Khad and other countries along the coast by boat • Tourism has been boosted in the last 15 years by government grants to local businesses; recent marketing campaign in Parabean is bringing in new visitors • Growth in providing outsourced services for nearby countries
Other Energy Companies	• The national energy company, BEC, has a moderate market share of service stations in Bavar, and a positive reputation with the population; it has not modernised as quickly as others in the market so is not a major player • International energy company, Parabean Energy, has a solid foothold in the market and is well known for both price and quality; they operate an oil field in northern Bavar, Parabean Field; interest in modernising the standard oil & gas operation • Sumarti Solutions, headquartered in Parabean, also has a good share of the service stations market and is very competitive on price	• The national energy company, Khadan, has the majority share of service stations and has a loyal following; their footprint and influence continues to grow but they have been slow to modernize and create a strong mix of renewable energy sources • Parabean Energy and Alforgas have made the first small inroads into offering alternative service stations in Khad, though they have not been received with great success yet	• The national energy company, Almay Renewables, has a reasonable foothold in the service station market, and has started to invest in greener sources of energy, such as wind and solar; it has also offered the first services for electric vehicles in the region (2 years ago) • The regional Bavar Energy Company (BEC) has thrived in recent years • Both Almay Renewables and BEC have loyal followings
Public Opinion	• The population splits into two groups in terms of its response to foreign investment and in particular, energy; those in major cities, are generally open to new investment, and appreciate the opportunities this brings; some remote communities in the mountains have been resistant to change and have been vocal about preserving their unique culture and way of life. • Eager to modernize the energy markets	• The population is mixed in its response to foreign investment, specifically investment from energy companies; generations experienced 'safe' employment in state-run organisations and are resistant to what they may see as 'uncontrolled' external forces; newer generations are more open to foreign investment and companies, especially if they bring renewable energy sources such as wind and hydrogen	• The population has traditionally been open to foreign investment, including investment from energy companies, as they provide the fuel that supports tourists getting around. In recent years there have been a small number of vocal voices who oppose large multinational energy companies • There has been a drive towards ecotourism and more environmentally friendly forms of energy.

Stakeholders* in the Turpaq Region





*A stakeholder is a person or group with an interest in a topic; Shell considers internal and external stakeholders; these stakeholder maps are not inclusive but are indicative of stakeholders often considered

**In order to access and produce hydrocarbons, Shell must lease mineral rights from the owner through multi-year deals whereby Shell pays the owners an annual rental fee and a percentage of the annual profit from the field – known as a royalty. If a hydrocarbon field is spread across the land of many different owners, the allocation of royalties is more complex and can be more expensive.
For construction projects related to any type of energy development, Shell will need to lease the surface land (or offshore area) from the owner, for any activities that disturb the surface, e.g. construction of a pipeline, installation of windmills, etc.

Oil & Gas Competitors in Turpaq

Shell currently has three main competitors in the region: Energiks, Parabean Energy, and Bavar Energy Company(BEC). Each undertake varying degrees of activity and have differing interests in the region.

Their current activity is described for you below. Due to the expected economic growth and further energy demands in the Turpaq region, it is likely that other competitors may enter the market.

COMPANY	WORLDSPAN	RELEVANT TURPAQ ACTIVITY
Energiks	Global	■ Operate a shale gas field in Northeastern Khad ■ All energy produced is sold to other countries. It is not sold in Turpaq. ■ Recently announced it's 5-year technology strategy, focusing on speed to deployment. They will dedicate $200 million to technological development. No specific projects have been announced, but based on their existing portfolio, it is predicted that they will invest significantly into technologies that aid the location of crude oil. ■ In the last 6 months, they were awarded an offshore lease but have yet to drill a well.
Parabean Energy	Global	■ Operate existing Parabean oil field in Northwestern Bavar, which they are trying to optimize via improved technology ■ Scout intel indicates that Parabean Energy is negotiating additional deals for O&G leases in Bavar. ■ No offshore exploration activities publicly reported or rumored.
BEC (Bavar Energy Company)	Regional (Bavar owned)	■ Operate one field in northwestern Bavar ■ Seeking joint venture partners for exploration and/or production activities. ■ Not a major player because have been slow to modernize

Comparison of hydrocarbon and renewable energy projects in Turpaq

- The Turpaq Team has progressed their evaluations of solar, wind, and hydrocarbon options sufficiently to make a relative estimate of the costs and timelines of delivery in this region. The chart below provides a general, relative comparison, but details of individual projects may vary.
- More detailed information about solar, wind and hydrocarbon opportunities is available on the following pages
- The team has not eliminated biofuels, or other possible energy sources, but has not thoroughly vetted them for risks, costs, and delivery time.

Energy type	Construction time	Construction cost	Lease costs	Scalability	Return on investment
Wind	Long* (>8 y)	Med-High*	Low	Medium	Low
Solar	Short (<5y)	Medium	Medium	High	Medium
Hydrocarbons	Medium** (2-10y)	Low**	High	Low	High

*Wind timelines and costs are currently challenged in this region due to supply chain issues; it is unclear how long these issues will persist.
**Hydrocarbon construction costs and timelines increase if LNG and/or CCS opportunities are included, or for certain offshore options; see next page for more details.

Oil & Gas Development Opportunities in the Turpaq Region

Shell's technical team has evaluated multiple areas for potential production of oil and/or gas in the Turpaq Region and has narrowed their assessment to three discovered but undeveloped fields (Apollo, Brontus, and Kratus) for further consideration. The locations of these three sites are shown on the map. If Shell progresses with any of the sites, it will prioritise providing crude oil and/or natural gas in the Turpaq region to meet increasing energy demands. Furthermore, Shell is committed to sell any produced gas or to dispose of it responsibly if it cannot be sold; there will be no flaring of produced gas.

Energiks operates a field in Khad near Shell's potential Kratus field and in the same geologic formation and reports production of ~1000 boepd per well. In Bavar, Shell's potential Brontus field is along the same structure and in the same geologic formations as BEC's and Parabean's existing fields. BEC reports production of 115,000 boepd from their field but has problems with high levels of toxic metal in water produced with the oil, thought to be a result of metal-rich interbedded shales.

Almay has the potential for LNG development, costing 10% more Construction & Opex but realising up to twice the revenue by selling LNG on a wider market.

Bavar and Khad have CCS potential. CCS development would incur an additional 100% Construction Cost + 30 % Operating Costs. In Bavar, any company using CCS will recover 50% of their royalty payments to the Bavar government. In Khad, the government has not announced any incentives for utilizing CCS.

	Subsurface		Estimated Reserves of Technically Recoverable Resources					Estimated Costs for Development				Landowners
Field	Reservoir geology	Reservoir Depth (meters)	Crude Oil (Billion Barrels – B Bbl)	Natural Gas (Trillion of cubic feet – Tcf)	Estimated First Production*	Est. Field life	Estimated Peak Production	Construction (Billion $)	Land Leases (Million $ Per Annum)	Royalty (% of Gross Revenue)	Opex (Million $ Per Annum)	
Apollo (Offshore Almay)	Sandstone with faulted compartments	3100	1.2 B Bbl	2.3 Tcf	Q1 2034	42 Years	2039	8.3	14	15%	555	Almay Government
Kratus (Onshore Khad)	High-porosity sandstone	448	-	10.2 Tcf	Q1 2026	34 Years	2030	1.0	20	15%	155	Khad Department of Land, Water, and Environment (64%), Khad City (21%), and private owners (15%).
Brontus (Onshore Bavar)	Sandstone with interbedded shale	3800	1.0 B Bbl	-	Q2 2030	30 Years	2032	2.0	10	25%	160	Bavar Department of Land Management (91%) and private owners (9%).

Note: BBbl = Billion barrels. 40 trillion cubic feet (Tcf) of gas = approximately 7 billion barrels' equivalent. Boepd = Barrels oil equivalent per day.
*First Production: the point when the well moves from development to operations – after construction, when the first gas or oil is produced from the well.

Wind and Solar Development Opportunities in the Turpaq Region

- Wind and solar costs are measured in mega-watt hours (MWh)
- Wind and solar are generally scalable
- For reference, the Khad government has indicated they prefer proposals for wind developments that have at least 1,000MWh capacity
- Wind and solar sell for $19 per MWh
- Construction costs are for notional projects, but could potentially be scaled up or down

Wind

- Shell is responsible for both the wind turbines and the sub-stations
- Wind leases operate on a 39 year cycle (1 year assessing and permitting; 5 years designing, engineering, constructing and commissioning; 33 years fully operational, with final year spent decommissioning)

WIND	Cost per Acre	Landowners	Construction CAPEX (capital expenditure)	OPEX (operating expense)	Type of Storage
Almay (Offshore)	$100	Government of Almay	$3B (additional cost is due to the offshore substation and higher price of land) for 64,000 acre lease	$15 per MWh	Battery, or Potential R&D Opportunity
Khad (Onshore)	$1,000	70% Government of Khad 30% Private	$2B for 60,000 acre lease	$10 per MWh	Battery, or Hydrogen*

Solar

- The average cost per acre to fully develop a solar farm is $450,000
- Approximately 6,000 acres are required to produce 1,000 MWh

SOLAR	Cost per Acre	Landowners	Construction CAPEX (capital expenditure)	OPEX (operating expense)	Type of Storage
Various locations in the Turpaq region	$1,000	Possibly governments of different countries and/or private landowners	$1B for 6,000 acre lease	$7 per MWh	Variable

*Hydrogen provides a higher energy density without the level of energy loss experienced by batteries

Research & Development Opportunities

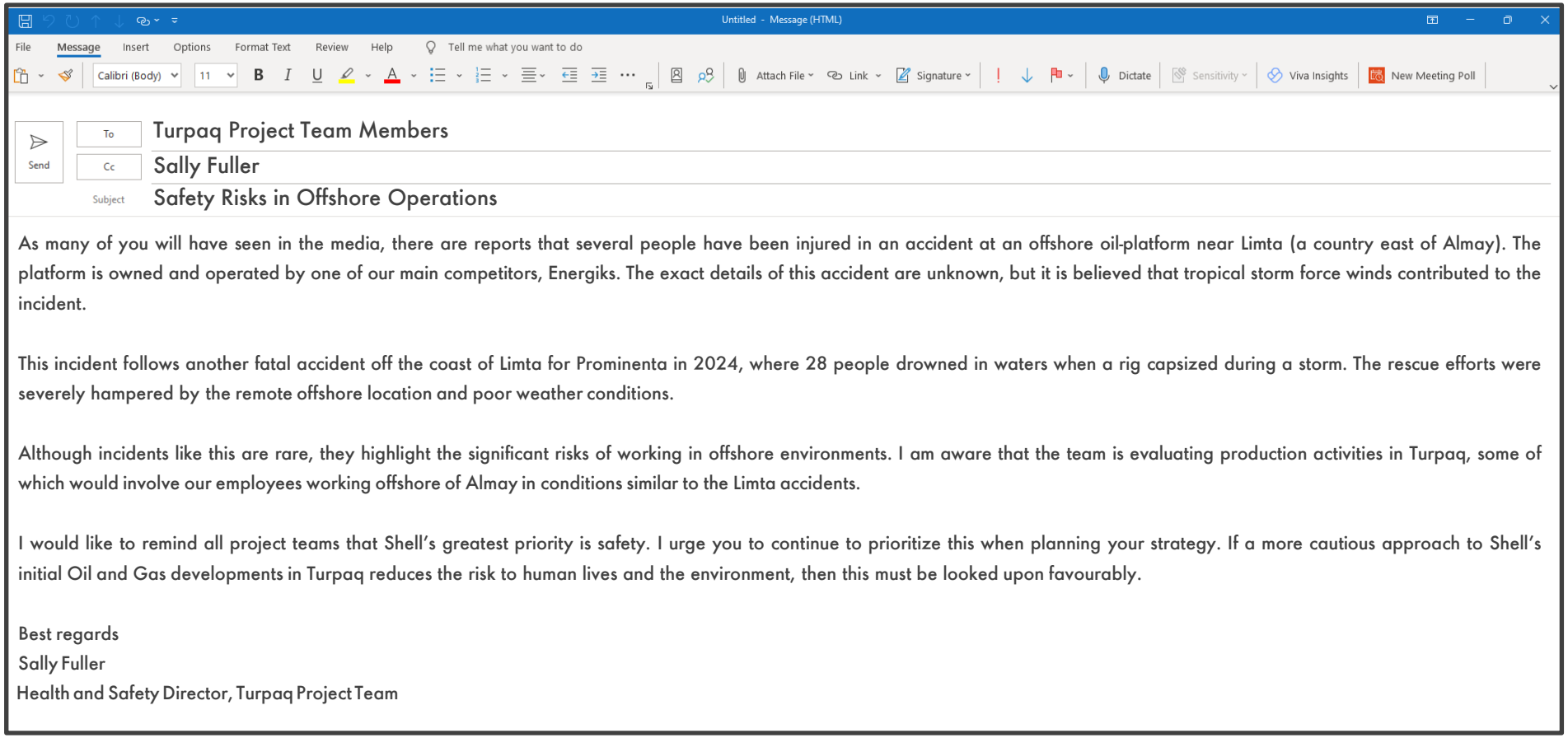
The Shell Technology Centre in The Hague (STCNL), where Turpaq R&D is conducted, is key to Shell's strategy to successfully expand into Turpaq. The work done there will help Shell respond to current issues faced by the energy industry, as well as create solutions for potential future challenges. The projects undertaken at STCNL are part of Shell's Research and Development (R&D) strategy. Resources are allocated to projects which are seen as providing the most value to Shell – both at a regional and global level. To choose projects for investment, the global R&D portfolio group meets every six months.

	Maturity*	Cost category	Portfolio Classification*	Possible Collaborations
Artificial Intelligence Seismic Processing Software • Seismic surveys are used to understand subsurface composition. • Software transforms survey data into a 3D picture of the sub-surface, showing the properties of rock formations. • Existing software can process and transform data to estimate reservoir properties like porosity and fluid fill, which are helpful both for exploring for oil and gas targets, and for finding safe storage reservoirs for Carbon Capture. • While many recent improvements have been made, these methods are still time consuming and there is room for improvement in accuracy of predictions. • This research will investigate use of AI and data science methodologies from other applications in seismic processing in order to reduce processing times and improve accuracy, with the aim of faster, better evaluation of subsurface CCS or hydrocarbon opportunities.	Green	Low (<$2MM)	Core	Floriez (Software Company in Almay) – proprietary off-the-shelf seismic software, wit limited experience in machine learning
Wind/Solar Energy Storage Research • Wind and solar installations suffer from changeable weather – when there is no wind or sun, no energy is produced. When the weather is favorable, sometimes too much energy is produced that cannot be used or sold. • Current designs often utilize batteries for energy storage; however, current battery systems lack the capacity or efficiency to completely resolve the issue, especially in areas with large variations in weather. • This early-stage, multi-disciplinary research proposes to evaluate several possible solutions to this issue, including improvements in battery efficiency and materials and storage of energy through other means, e.g., compressed air or water or gravity driven systems. The goal is to find a solution most suitable to the local region's climate and resources.	Amber	Medium ($2MM - $10MM)	Firsts	DINA (Engineering Company in Almay) – specialists in batteries and metals; development phase only Khad Department of Energy – ongoing research in alternative energy sources; research and development phases
Carbon Capture Efficiency • To reduce the amount of CO2 released from energy production and industrial processes, many energy companies are investigating new technologies and methods to support carbon capture and storage. • This technology the CO2 from a power production plant, factory, or directly from the atmosphere, transporting the gas to an appropriate storage location (perhaps through pipelines), injecting it into an underground safe reservoir, and monitoring it to verify its storage. • Currently the process requires considerable energy in itself; new technologies are required to capture it more effectively and efficiently, including direct capture from the atmosphere, and to sequester it more effectively via better methods of either storing it or recycling it for other purposes (e.g., support plant growth or incorporation into building materials). • This large-scale multidisciplinary research will evaluate and pilot several new technologies for capture and storage.	Green	High (>$10MM)	Core	National University of Bavar – scientists focused on new energies and CCS; research phase only

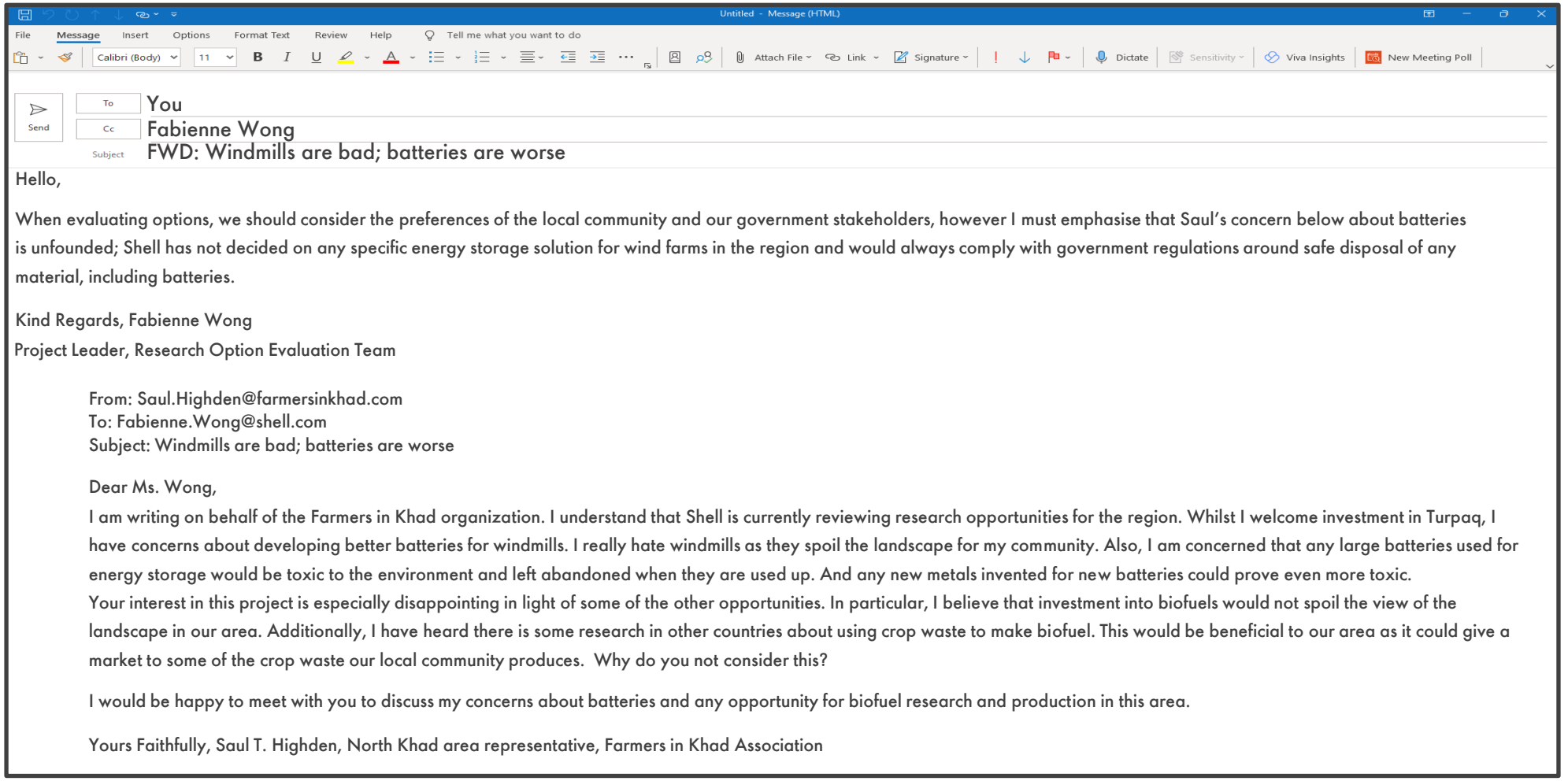
Maturity (development stage)
- Amber ratings are given to partially defined technologies which will require 3-5 years to bring them to deployment.
- Green ratings are given to technologies which are fully defined and only need adjustment or refinement to bring them to deployment within 0-3 years.

Portfolio Classifications
- 'Core' technologies represent a refinement of existing technologies and create value through fast deployment at low cost
- 'Firsts' provide a revolutionary approach to existing challenges and create value through competitor advantage

Internal Communications



Internal Communications



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Send

To You

Cc Fabienne Wong

Subject FWD: Windmills are bad; batteries are worse

Hello,

When evaluating options, we should consider the preferences of the local community and our government stakeholders, however I must emphasise that Saul's concern below about batteries is unfounded; Shell has not decided on any specific energy storage solution for wind farms in the region and would always comply with government regulations around safe disposal of any material, including batteries.

Kind Regards, Fabienne Wong
Project Leader, Research Option Evaluation Team

From: Saul.Highden@farmersinkhad.com
To: Fabienne.Wong@shell.com
Subject: Windmills are bad; batteries are worse

Dear Ms. Wong,

I am writing on behalf of the Farmers in Khad organization. I understand that Shell is currently reviewing research opportunities for the region. Whilst I welcome investment in Turpaq, I have concerns about developing better batteries for windmills. I really hate windmills as they spoil the landscape for my community. Also, I am concerned that any large batteries used for energy storage would be toxic to the environment and left abandoned when they are used up. And any new metals invented for new batteries could prove even more toxic.
Your interest in this project is especially disappointing in light of some of the other opportunities. In particular, I believe that investment into biofuels would not spoil the view of the landscape in our area. Additionally, I have heard there is some research in other countries about using crop waste to make biofuel. This would be beneficial to our area as it could give a market to some of the crop waste our local community produces. Why do you not consider this?

I would be happy to meet with you to discuss my concerns about batteries and any opportunity for biofuel research and production in this area.

Yours Faithfully, Saul T. Highden, North Khad area representative, Farmers in Khad Association

The Turpaq Business Insider

Claasmat is Coming to Bavar

Days after an internal document referring to a major new manufacturing site was found at a popular café, the Bavar Times can confirm a new vehicle factory will be built by German auto manufacturer Claasmat. This confirms ongoing rumours about whether Claasmat was ready to expand into the Turpaq region. There are suggestions that it's latest FCEV (Fuel Cell Electric Vehicle) is ready for a major launch in the Turpaq region. FCEVs are vehicles with an electric motor, generally using oxygen from the air and compressed hydrogen to generate electricity.

The lost document suggested land negotiations have been ongoing for the last three months and are due to be finalised within weeks. Detailed plans suggest Claasmat will be bringing the very latest in robotic production methods and will be producing both it's new FCEV and a percentage of well-known cars and trucks.

Hydrogen-fueling Heavy Goods Vehicles (HGVs) on the horizon in Khad

Khad's increase in manufacturing facilities and general productivity has shown the world that Khad is fast becoming a global player in multiple markets. Production of machinery itself is nothing new, and residents have already been wowed by the introduction of world-class robotics in several of our leading facilities.

However, something even more exciting is due to arrive soon. Something that may in fact help unite our country, pulling together those who resist industrial progress and those who embrace it. We are about to witness the birth of FCEV (Fuel Cell Electric Vehicle) trucks and vans.

The government has announced a partnership with our very own Kralak Heavy Haulage Manufacture, the local firms JRL and RaansLab, and the Austrian Tirolt. Tirolt has been producing FCEVs in other countries and the model is receiving positive adoption in the past 2 years as haulage firms seek to decarbonise. Tirolt is seeking new partnerships and a location to manufacture its model and has settled on Khad. We believe this may be indicating a new era of collaboration in our country and beyond.

As the new vehicles go into production interest has been shown by three local firms to test them as fleet vehicles.

Tirolt have also made clear their intention to develop Plug-In Hybrid Electric Vehicle and Battery Electric Vehicles models in a phase II development, as demand increases for electric mobility in market.

The Turpaq Times

The Renewable Energy Revolution

The Khad government has been under recent pressure from the Department of Environment, Land, Water and Planning to drive and support forms of renewable energy in the region. Due to its climate, Khad has strong winds and, in the summer months, long hours of much sunlight. Therefore, you could question, why hasn't the government – or energy companies for that matter – invested in solar or wind energy before now?

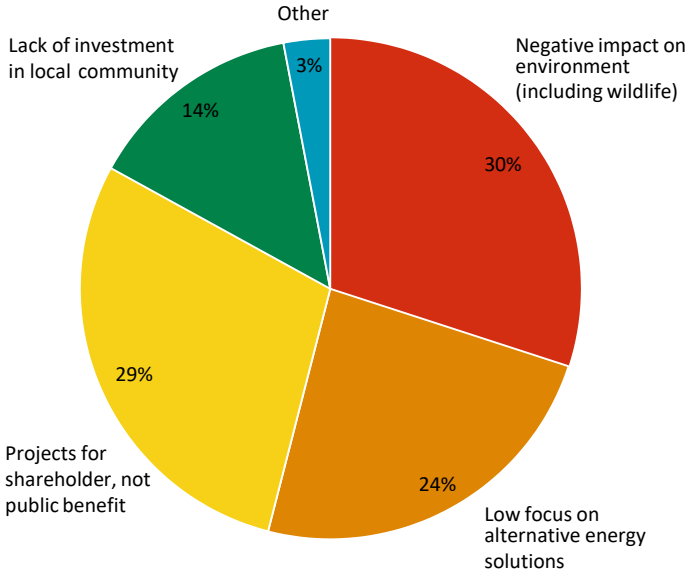
In the case of wind farms, for example, until relatively recently, the climate has posed several challenges, including: winter ice causing turbines to freeze and slow, reducing the amount of power produced; changeable weather – when there is no wind, no energy is produced. When there are high winds, sometimes too much energy is produced that cannot be used or sold; a lack of specially equipped vehicles to help transport the materials and support the build; the expense of installing wind farms –the cost of onshore wind farms has nearly doubled in the last 10 years (partly due to steel prices); complaints and demonstrations from nearby residents and investors in property and the tourist industry about spoilt views.

However, there have been rumours that the Khad government has been inspired by the Parabean system, whereby energy companies bid for sites on which to build wind farms. The government regulates all the conditions for how it is built. This means that the energy companies are kept 'under control' and, due to the bidding process, costs for sustainable energy are minimised.

Furthermore, there have been recent advancements in the development of wind turbines: longer blades meaning increased efficiency; and heating systems inside the turbines, which can be activated upon detection of cold temperatures, helping to melt ice on the outside of the turbines.

But have these developments helped to bridge the gap, making sustainable energy a more attractive option for energy companies, and indeed the government, to support? Only time will tell. The government is expected to announce its position and any further subsidisation within the next month.

Public perceptions of the energy industry in the Turpaq Region vary. Below is a graph containing reasons given for votes of low public confidence in 2026.



Developments in Turpaq: Looking Forward and Looking Back

Recent investment in infrastructure, tunnels and service stations has led to significant steps forward in opening the Turpaq Region for haulage.

Torvar Tunnel

The Harlan Mountains have historically been a source of challenge for getting vehicles through the Bavar-Khad border. As the requirement for heavy trucks through the mountain passes has increased, so have the queues at the Porvan tunnel and the Krikan overpass. The Torvar Tunnel, completed three months ago, has significantly improved traffic flow. Tolls are still a slight source of contention. The cash booths still experience long queues, and some argue there were too few booths allocated for cash which is still frequently used. Additionally, last week a group of 50 protestors blocked traffic entering Khad from Bavar for four hours. Many of the protestors carried "Save Our Agriculture" and "Save Our Landscape" signs. It is believed that they were from EnvironmentNow, which has grown in popularity after starting in Almay two years ago.

Road surface improvements in western Khad

The vast planes of Khad first experienced concrete east-west highways 18 years ago. Providing almost entirely flat expanses, laying the highways was considered easy. Whilst the region was historically renowned for flooding, the concrete highways have increased the regularity of flooding due to decreased drainage. The extremely windy conditions across large swathes of western Khad can blow dust that completely covers the roads, especially in areas that had been farmed. The Khad Government has made some significant investments to improve roads in Khad. This has included resurfacing roads and building high verges to hold back dust in strategic points. We expect this may well encourage greater haulage through Khad (west/east), making journeys safer and more profitable.

Almay: An untapped frontier?

Almay has generally been seen as the reserve of rental-car driving holiday makers, motorcyclists taking in the coastal views, and more recently, fuel cell vehicles for those able to invest in them and their low-carbon properties. But could the sunny strip be opening for haulage? The coastlines of Jirvir have long enjoyed a steady shipping trade. Goods from countries to the south across the Sumarti Sea would reach Jirvir by boat and travel north via a reliable trucking fleet. **Recent political and economic shifts, in Jirvir in particular, have led to a spate of pirate attacks off the coast of Jirvir.** Whilst 85% of shipping still arrives, companies are already looking for safer alternatives. With the newly resurfaced roads in western Khad enabling smooth passage into Jirvir from the north, there have been rumours of a permanent shift in transportation of goods. Three global shipping firms have already begun to transport goods through Khad into Almay as a temporary measure, which may become permanent Tirolt have also made clear their intention to develop Plug-In Hybrid Electric Vehicle and Battery Electric Vehicles models in a phase II development, as demand increases for electric mobility in market.

The Turpaq Times

The Renewable Energy Revolution

A letter from William Flowerberg, of Flowerberg Market Analysts, has been leaked. Flowerberg is warning Shell about a negative impact on their Flowerberg Sustainability Index should Shell increase production in the Bavar oil fields. Read the full content of the letter below.

Dear Madam/Sir,

As a key stakeholder to Shell, I am writing to express concerns over proposed expansion of oil and gas activities in the Turpaq region. Through our channels we heard you are considering an increase in production from the oil fields where you are a partner in in Bavar. Even though you are only a minority partner, we need to warn you that such increase can have a detrimental impact on your rating in the Flowerberg Sustainability Index (FSI), as we fail to understand how this aligns with the Paris Agreement targets and your own Powering Progress Strategy.

Increased production will lead to an increase in carbon emissions from the oil fields, which already reportedly have a high rate of methane leaks, and we are concerned by operators choosing to flare the extra gas. In addition, we understand that the additional production will be used for LNG export via Almay, and hence will not contribute to lowering the use of coal for electricity production in Turpaq or Parabean.

We hope to have provided you with food for thought and look forward to your submission for next year's sustainability rating. As you know, the FSI is currently the leading ESG (Environmental, Social, Governance) index in most markets and we are proud it is also used to identify sustainable stocks for Equator Principles banks and the EU green taxonomy.

Warm regards,

William F. Flowerberg

Founder/CEO Flowerberg Market Analysts

Khad: Storm ahead for conservation?

It has long been a well-kept secret, but the floodplains and agricultural areas in Khad are now well recognized as essential stop-overs at the Central Turpaqian Flyzone. Millions of birds pass each year as they migrate and use the favorable windy season to avoid the hard trek over the harsh Harlan Mountains. The floodplains have provided a resort for the birds for thousands of years and the agricultural plains have provided extra food sources for the last hundreds of years.

Scientists, local farmers and the emerging eco-tourism industry have discovered the spectacle of the large clouds of birds and flock to the area during the migration season, which partially coincides with the windy flood season.

However, ecologists have now raised alarm over recently announced studies to develop large wind farms in the area. They expressed grave concerns over the potential impacts of the rotating blades of the wind turbines on the bird populations. The local Khad birding society pointed out: "Our local population is in favour of wind energy, but we believe they do not yet understand the potential negative impact on our birds. We look forward to working with the government to set conservation standards that protect our nature." Birdlife International spokesperson Sam Wood was more outspoken after a recent international conservation summit. He said, "We do support wind energy as an alternative for fossil fuels, but we also believe that it cannot be developed just anywhere. We see the Khad plains as a key battle ground to establish what is acceptable." Any energy company wishing to develop wind farms in Khad should invite conversations with these stakeholders before making any definitive plans. Birdlife International is especially interested in partnering with an energy company to meet the energy needs without causing irreparable damage to the environment.

Save Our Sumarti Sea – Sign the Petition

We, the people from the world, ask the Almay government to step up efforts to protect and preserve the Almay Coral Reefs. Those of us who have been fortunate enough to visit the Almay coast, know it is a beautiful and unspoiled area of the world. Characterised by small villages, a beautiful coastline and some of the finest coral reefs in the world, the local communities enjoy a peaceful existence for now…

Any interest to build a major LNG plant near the Almay Offshore Protected Areas is concerning. The construction of such a major installation plant, dredging a 2 km long access channel for huge LNG tankers and the expected effluent from boiling hot cooling water, will harm, if not destroy, the coral reefs. That will be a blow to the local biodiversity and to the livelihoods of artisanal fishermen, who depend on the fish species that spawn and live near the coral. We ask the Almay government to stop the madness and to forbid industrial development near the Almay Offshore Protected Areas. Instead, the area should be made a World Heritage Site, so all mankind can enjoy its natural wonders.

Do the right thing! Visit "People for the Protection of the Almay Coast" to sign a petition. Already 25,685 people from 86 countries signed, including 15,000 Almay locals.

Appendix

Glossary of Energy-Related Activities in Turpaq

Opportunity or Activity	Additional Information
Wind Energy	Wind turbines collect and convert the power of wind into electricity that can be used to power the grid. Wind farms can be onshore, offshore (fixed), or floating. Floating wind can be installed in deeper water and opens up new areas for offshore wind. Shell is one of the most experienced companies in offshore technology. Many of the capabilities that were used in offshore oil & gas are transferable to wind. Wind farms require substantial capital investment as construction costs can be high.
Solar Energy	Solar energy is created by capturing the thermal (heat) energy generated by the sun. Photovoltaic (PV) cells convert sunlight into electricity. PV cells can be small and power hand-held devices, or there may be PV power plants that cover many acres of land, powering hundreds of homes. Solar has limitations due to sunlight inconsistency (time of day, season, location, weather) and amount of square footage required to collect a usable amount of energy.
Natural Gas	Natural gas is a mixture of naturally occurring gases, mainly composed of methane, and is the cleanest burning fossil fuel. To access the gas, wells are drilled into underground porous rocks (reservoirs), which produce the gas (allow the gas to flow) into surface infrastructure. It can be transported by pipeline or ship and can be used in a variety of ways, including supplying power stations, homes and businesses through national gas grids. The hydration level of the gas is an important issue. In some environments, wet gas needs to be chemically treated to avoid it freezing or the formation of gas hydrates within the pipeline, which would cause blockages and damage.
Crude Oil and Solution Gas	Crude oil is a yellow/black liquid and is a mixture of hydrocarbons, otherwise known as unrefined petroleum. Like natural gas, it is produced to the surface via wells drilled to underground reservoirs. Crude oil is refined and separated using fractional distillation to form useful products, including fuels like diesel fuel, gasoline, butane and jet fuel, or it can be combined with other non- hydrocarbons, to create other end products such as plastics, lubricants (i.e., motor oils) and paraffin wax. Fractional distillation involves heating the crude oil at extreme temperatures and takes place at the oil refineries/treatment plants. Solution gas is natural gas which is dissolved in the reservoir along with crude oil, condensates, and water. It is also known as dissolved gas as it remains dissolved in the solution until it experiences a pressure and temperature change during production. Once the gas is at atmospheric temperature and pressure, it becomes free gas which can be utilised for wellhead operations or sold to market.
Biofuels	Biofuels are fuels derived from biomass, which is plant material or animal waste. They are considered renewable energy. The most common biofuels are ethanol and biodiesel. Ethanol is derived from corn or sugarcane and is used in gasoline . Biodiesel can be used as a fuel, similar to coal or natural gas. Biofuels require land to grow the crops.

Glossary of Energy-Related Activities in Turpaq

Activity	Additional Information
Liquified Natural Gas (LNG)	Liquefied natural gas (LNG) is a clear, colorless liquid formed when natural gas is cooled significantly. Natural gas can be piped to an LNG plant where it is cooled to a liquid, shrinking its volume for easier and safer transport. LNG plants can be either onshore or offshore platforms. The LNG can then be transported to population centers located away from gas fields. After transportation, it can either be regasified and used as natural gas or used directly as an alternative to gasoline. Shell is one of the world's largest LNG shipping operators and continues to improve LNG technology. Large LNG plants often use ocean shipping and are typically built near harbors.
Hydrogen	Hydrogen gas is a low carbon fuel. It can be derived from natural gas (called "blue hydrogen" when associated CO2 is captured via CCS or otherwise sequestered) or produced by electrolysis of water (called "green hydrogen" when the electricity used in the process is from a green energy source like solar or wind). When hydrogen gas is burned in a fuel cell, water and heat are the only emissions. It is also a very efficient fuel. Many systems that are currently powered by natural gas could be upgraded to effectively use hydrogen. It can be used in cars, for portable power, or in buildings.
Nature-Based Solutions (NBS)	Nature-based solutions aim to protect, sustainably manage and restore natural or modified ecosystems and address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits. At Shell, we're investing in NBS through projects that work with ecosystems such as forests, grasslands, wetlands, and coastal zones, or projects that improve agricultural sustainability. These NBS projects absorb more CO2 or prevent the release of greenhouse gases, while also delivering benefits to local communities and biodiversity of the area. Carbon credits are one of the mechanisms for investing in these NBS projects; each tonne of CO2 stored or avoided by a project generates one credit, which can be sold to help fund the project.
Carbon Capture and Storage (CCS)	Carbon capture and storage (CCS) is a method to reduce the amount of CO2 released from energy production and industrial operations. This process involves the capture of CO2 from a source (e.g., power production plant) transporting the gas to an appropriate storage location (perhaps through pipelines), injecting it into an underground safe store through a well, and monitoring to verify storage of the CO2. The store is in porous rocks (a deep aquifer (not groundwater protected zones) or a depleted hydrocarbon field). Under certain tax structures, CCS capacity can be sold to other operators or industries.

Summary of Operations and Opportunities Evaluated by the Team

	Bavar	Khad	Almay
Current Operations	• Shell entered the market in Bavar six years ago, building four initial stations in major cities; three more followed four years ago • Gaining market share has proved challenging due to significant competition, particularly from Parabean Energy • Shell is currently successful largely because its stations are not close to other competitors' sites; in the town of Viento, where Parabean Energy has two stations, Shell's station is struggling • This competition also reflects in hiring talent; Shell struggles to retain top talent in Bavar due to strong competing companies in the region • Shell is a minority owner of the Parabean Field in Bavar; like Parabean Energy, Shell is looking to modernize this operation using technology (Carbon Capture & Storage, remote surveillance) as part of the Powering Progress strategy	• Shell chose to invest in Khad by building four service stations in the most significant cities across the country in 2020 • The use by residents has been reasonable but Shell has faced significant challenge from national energy company, Khadan; in the town of Klovar, where Parabean Energy has two stations, Shell's station is struggling • Shell has a small, non-operating share in a chemicals plant in the chemicals park in Khad but has not driven for growth or diversification in this area for quite some time; Khadan, the Khad national energy company, is the operator and majority partner	• Shell entered the market five years ago, building four service stations initially and another three twelve months later • Gain of market share has been reasonable, but the locals tend to be loyal to the national Almay Renewables, and more and more tourists tend to make the choice not to rent cars but to stay in one location for their holiday and travel on foot or bicycle to see local sites
Possible Opportunities*	• Onshore oil and gas development in the Brontus Field • Carbon Capture & Storage in western Bavar	• Onshore oil and gas development in the Kratus Field • Onshore wind farm • Onshore solar farm • Biofuels • Carbon Capture & Storage in Eastern Khad	• Oil and gas development in the Apollo Field • Offshore wind farm • Liquified Natural Gas plant • Nature Based Solutions

*This list is not inclusive of all options and the team continues to evaluate possibilities.