Climate Change

Description	Climate change may impact on the environment and PTTEP's business from frequent natural disasters, stringent national & international policies, regulations and a drive towards low carbon future. Thailand committed to reduce GHG emissions by 20-25% by 2030 (2015 base year), while the end use of energy is accounted for more than 75% of national emissions, regulatory & policy changes will impact to energy industry. The Alternative Energy Development Plan (2015-2036) set to increase 30% of alternative energy consumption, poses risks to demands of fossil fuel, while promotes low carbon and renewable energy. PTTEP identified Climate Change Risks as Physical Risk refers to the risks from the physical impact of climate change (e.g. heat wave, heavy precipitation, cyclone, drought & water related) and Transition Risk from change in policy, law, technology or market shift to green energy. A conventional perception of not-so-green oil and gas industry also pose reputational risks for companies without actions.
Impacts	In addition to physical impacts of climate change (e.g. natural disasters), potential climate transition impacts to business include regulatory changes (e.g. future carbon tax, emission trading schemes imposed by governments in PTTEP's operating countries) which could increase the costs to adapt our production in compliance with new climate change legal frameworks and policies. Company revenues will be affected by the shifting in demands towards low carbon & renewable energy. Company's enterprise value is also at risk, as the credit ratings turns to focus more on company's climate change performances. Increased in disclosures required, such as by CDP, TCFD, and Climate Action 100, and Moody's credit ratings. Therefore, S&P is looking deeper in the company's performances and ability to disclose climate change risks and impacts in accordance with their criteria, such as the climate related financial risk as criteria set by TCFD.
Mitigation	PTTEP assessed risks for timely improvement across all new operation sites and for compliance with modified requirements both at national and international levels. PTTEP developed mitigation plans/ risk management plan, focusing on improving work processes to maximize energy efficiency and 25% reduction of GHG emissions by 2030 (compared to base year of 2012). Moreover, PTTEP conducted studies on potential CO2 sequestration and carbon offsetting mechanisms. Correspondingly, PTTEP also engaged with Thailand Greenhouse Gas Management Organization to develop activities, measures and policies to reduce GHG under the Thailand Voluntary Emission Reduction project. PTTEP also explores new business opportunities, including businesses along the gas value chain, such as natural gas power plants, development of LNG and renewable energy and energy storage opportunities which will also support transition to low-carbon society.

Disruptive Technology

Description	E&P companies will face impacts from disruptive technology to energy industry (i.e. rapid technological advancement has accelerated R&D efforts in alternative energy, making it cheaper and more accessible). These technologies come in form of electrical energy storage devices and systems, as well as electric vehicles. Oil demand has consequently been affected and consumers for alternatively energy potentially increases. Moreover, Alternative Energy Development Plan (AEDP) (2015-2036) that aims to increase the proportion of alternative-energy consumption in the forms of electricity, heat, or biofuel to 30% of the final stage of energy consumption in 2036, can cause tremendous damage to the petroleum industry This situation will be PTTEP's primary strategic risk as it directly impacts our revenues from crude oil, condensate and oil-linked gas sale. Additional risks include the loss of production cost advantages due to accelerated technology development by competitors.
Impacts	The future energy transition to renewable energy means decrease in oil demand which has impacts on PTTEP's revenues. PTTEP's crude oil and condensate made up 31.92% of total revenue. Another is the loss of cost competitiveness (i.e. production cost advantage due to accelerated technology of competitors). These are potential impacts from disruptive technological advancement and the increasing use of renewable energy. With the increasing demand for natural gas, PTTEP generate natural gas revenue which make up appropriately 60.25% of total revenue and continue to seek investment opportunities in the gas value chain business in the form of Gas-to-Power.
Mitigation	PTTEP's business strategy anticipated advancing technologies and drive transformation. First it enhances competitiveness through technology (e.g. AI, Machine Learning) which enables fast, effective and informed decisions to increase exploration successes, enhance potential development capacity & increase production. Second through Organization and New Normal Transformation allows PTTEP to adopt a management process that empowering the capabilities of our people, strengthening corporate mind-set & culture. This accelerated decision-making & responsiveness, to ensure continued reductions in costs & natural resources required for operations. PTTEP explored new business opportunities in natural gas value chain to enhance operation flexibility and competitiveness e.g. Gas to Power in Myanmar, established subsidiary, ARV and to become a platform of PTTEP choice to deliver cutting-edge AI & robotics solution for our best-in-class performance to maintaining competitiveness & investment in renewable Energy.