

Physical and Transition Scenario Analysis

Physical Scenario Analysis

Assumptions: Water shortage impact is assumed without any mitigation plans. In practice, B.Grimm Power actions are able to reduce risks significantly.

Impacts in baseline scenario: Baseline scenario is based on RCP4.5. Water scarcity driven by climate change has the potential to impact B.Grimm Power's business as water is required by our plants in order for production to occur. We have estimated typical impacts to B.Grimm Power business in the baseline over a period of 10 years as a range of THB 116-464 million impact to revenue based on impacts from water shortage 15-60 days.

Impacts in RCP8.5: water stress worsens in RCP8.5, increasing the impact to revenue to THB 162-649 million based on water shortage of 21-84 days.

Quantitative impact:



Estimation of revenue impacts from water stress (daily)

Over 10-year period

Based on historical data (1-2 times, 15-30 days each)

	No. of days	THB mn
min	15	116
max	60	464

2030-2040F based on RCP 8.5*

	No. of days	THB mn
min	21	162
max	84	649

*RCP 8.5 refers to the concentration of carbon that delivers global warming at an average of 8.5 watts per square meter across the planet, representing "business as usual" scenario
Source: WRI Aqueduct

Upstream assessment: Our fuels are sourced from large corporate such as PTT, who have resilient measures in place to ensure that supply of fuels is sustainable even under extreme events. Therefore, in our risk screening we have deemed upstream risks as less significant, and therefore the financial impacts as less significant too.

Downstream assessment: In the event of physical climate change, our customers and end users will still have increasing demand for electricity and temperature increases may even drive demand up. Additionally, even under IEA STEPS scenario (IEA World Energy Outlook 2020) where there are still significant physical risks from temperature rise of around 2.7 degrees Celsius, there is projected increase in global and South East Asia demand for electricity.

Transition Scenario Analysis

In our carbon pricing analysis we assume that B.Grimm Power is not able to pass on this carbon cost to the customer. In the case that B.Grimm Power can pass on the cost to the customer the financial impact is lowered, the level of lowered impact would depend on assumptions on whether demand would be lowered or not as well as how many percent of the cost can be passed on to the customer.

Carbon Tax Assumption

Impacts in STEPS scenario: In our scenario we assume the worst case that Thailand and other South East Asian countries we operate in implements a carbon tax. Carbon pricing in baseline in line with Thailand NDC is at around 3.75 USD/tCO₂e in 2025 (based on Singapore carbon tax rate). This has a Catastrophic effect to B.Grimm Power (according to our Enterprise Risk Management guidelines >9% impact to earnings) since B.Grimm Power would need to pay around THB 778 million in carbon tax to the government, or around 13.9% of earnings.

Impacts in SDS: under SDS carbon prices would increase to around 7.5USD/tCO₂e (assumption of double of price in line with IEA trends. Therefore carbon taxes would double to around THB 1,556 million and impact to earnings would rise to around 27.9%.

Cap and Trade Assumptions

Impacts in STEPS scenario: Under the baseline scenario we assume a cap and trade system in all countries we operate in South East Asia similar to EU ETS, with carbon cap set to decrease 2.2% annually (same as EU ETS). The carbon pricing level is assumed to be at the same level as China as per IEA's World Energy Outlook 2020 report (IEA WEO 2020). China is the closest proxy to South East Asia and it also uses an ETS system, and this is the reason why we utilize China carbon prices. In the STEPS scenario China 2025 carbon price is USD 17/tCO₂e. This would yield financial implication of THB 78 million payments to government, or around 1.4% of earnings. This would classify as a Insignificant risk according to our Enterprise Risk Management guidelines.

Impacts in SDS scenario: Carbon price for China rises to 43 USD/tCO₂e in 2025 under the SDS. This increases the financial implication to THB 196 million or around 3.5% of earnings. This would classify as a Minor risk according to our Enterprise Risk Management guidelines.

Quantitative impact:

	Financial Impact to Normalized Net Profit (THB Million) in 2025	
Scenario	Carbon Tax	Cap and Trade
Baseline	778	78
SDS	1,556	196
Change due to low carbon transition	778	118

	Financial Impact to Normalized Net Profit (%) in 2025	
Scenario	Carbon Tax	Cap and Trade
Baseline	13.9% (Catastrophic (5))	1.4% (Insignificant(1))
SDS	27.9% (Catastrophic (5))	3.5% (Minor(2))

Upstream impacts: Increase in carbon price and changes in demand may increase the price of fuels under a transition scenario. However, the majority of costs can be passed on to customers.

Additionally, these upstream impacts will also affect our competitors, therefore not having an effect on our overall position in the market. Our growth into renewables will also help negate this risk.

Downstream impacts: As mentioned under physical risks, demand for electricity will grow under both physical and transition scenarios. As we adjust our portfolio towards more renewable energy we can supply the demand from customers. The more our customers are affected by carbon prices, the more they will seek lower carbon energy solutions. Therefore, overall downstream impacts are likely to be an opportunity for B.Grimm Power.