

# AIS: Task Force on Climate-related Financial Disclosures (TCFD) Report 2022

AIS is the largest telecommunication service provider in Thailand and aspires to be the Digital Life Service Provider leveraging upon our strength in telecommunication infrastructure and service expertise as well as nationwide customer base. We consider ourselves as part of the technological ecosystem to deliver digital technologies and services in order to drive growth in the low-carbon economy while enhancing social welfare and be a part in curtailing climate-related impact.

We are an early adopter of the Task-Forced on Climate-related Financial Disclosures (TCFD) by applying the framework to report on how we govern, plan, manage, and measure our business impact from and to the climate change. We apply the following four elements which are outlined in this document.

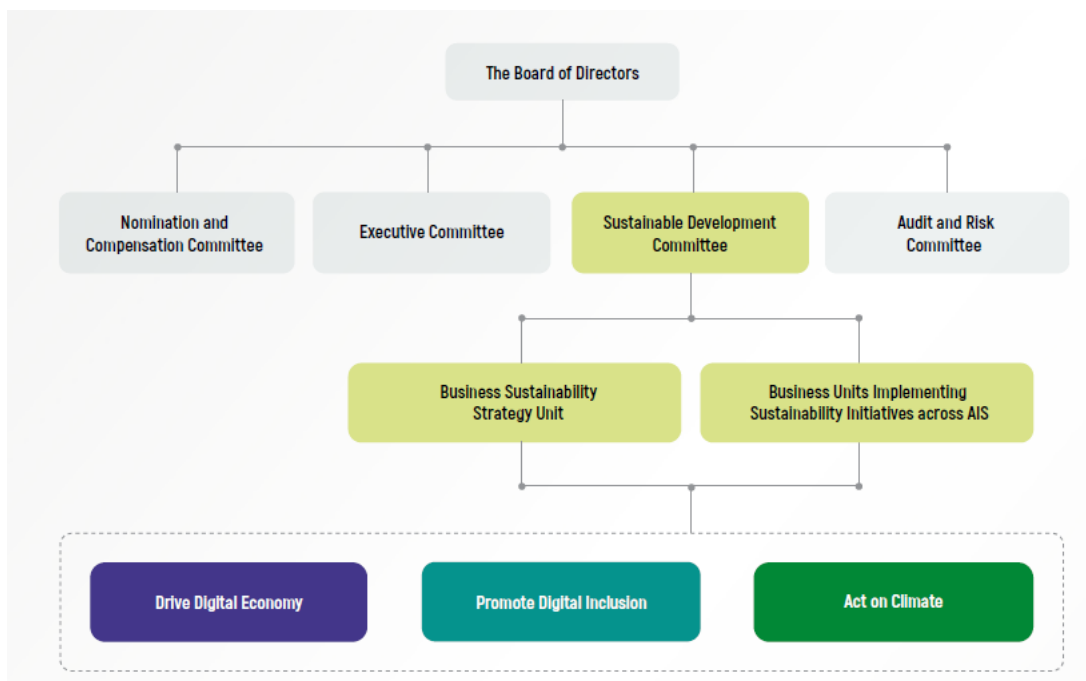
Part 1: Governance

Part 2: Risk Management

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## Part 1: Governance



Managing the climate-related impact to our business is a part of our enterprise risk management process as well as from the lens of sustainable business development. The Board of Directors has oversight on the risk management which includes climate-related risks and assigns the Audit & Risk Committee for an independent view and recommendation to ensure appropriate risk assessment, monitoring, reporting and control activities. The Board also assigns the Sustainable Development Committee, which is a board-level committee, chaired by an independent director and consisting of the CEO and 2 non-executive directors, to guide and has focus on the long-term climate-related aspects with a clearly defined strategy and target.

At the management level, the management committee, which comprises of the CEO and C-level management, is responsible for assessing and managing climate related risks and opportunities and guiding relevant business units and/or teams to execute proper mitigation and adaptation. At the working level, the Business Sustainability Strategy Unit is responsible for driving climate-related policy and strategies and coordinating with other related business units to materialize the policy and strategies to achieve the targets.

For the target setting, The Business Sustainability Strategy Unit acts as a focal point to collaborate with related business units to assess our GHG emissions and work on setting short-, medium-, and long-term goals to reduce greenhouse gas emission to align with the Science-based Target Initiatives (SBTi). AIS planned the adaptation and mitigation actions by committing to reduce greenhouse gas, continually improving energy efficiency, supporting renewable energy, and encouraging our trade partners and equipment suppliers to play a part in the sustainable business goals. The Business Sustainability Strategy Unit and the heads of other related business units shall report the results, significant issues, and concerns on our climate action strategy to keep the Sustainable Development Committee informed at least twice a year. Moreover, the climate-related risk, targets, and performance are reported to the Board of Directors on an annual basis.

Specifically on environmental management plan for our network, the Chief Technology Officer (CTO) is tasked with carrying out the programs implementing environmental management across the organization, from its core business to its auxiliary endeavors. A team of environmental experts provides a quarterly report to the CTO to inform actions, as well as monitors regulations, measures and relevant technological trend to constantly improve the environmental management plan. A report on environmental efforts is presented to the Sustainability Development Committee and the Board of Directors on the annual basis.

The compensation structure is designed to balance the achievement of both short-term and long-term priorities to ensure the sustainable growth of the business and proper risk management. Apart from performance metrics that assess the management on financial, strategic, and key operational objectives over short, medium, and long term, some management's KPIs are also tied with climate-related incentives. In terms of Climate-related Management incentives. For example, Chief Technology Officer's KPI ties into OPEX savings such as reduction in energy usage from networks. Incentivized KPIs include Energy reduction project and Energy Reduction target, which translates into Scope 2 emissions reductions. The energy reduction KPI impacts the financial indicators in the company balance scorecards. Thus, the achievement of these KPIs is reflected in annual salary and bonus. Management KPIs then cascade down to business units and employees. Some senior managers and experts, who work at data centers, also have KPI tied to data center energy management indicator or Power Usage Effectiveness (PUE). The result of the assessment directly reflects to Merit and Performance Bonus.

## Part 2: Risk Management

Telecommunication and digital services have become the lifeline of every aspect of people's personal and professional lives, and are considered as significant infrastructures that facilitate economic growth and development. AIS realizes that climate-related risks are critical issues that could impact how we run our business and operation, both today and in the future. Therefore, we have incorporated climate-related issues into our overall risk management process and develop formal processes that engage our Board of Directors, management team, and relevant departments.

## **The integration of climate-related risks with overall risk management**

AIS performs a materiality assessment every 3 years to evaluate sustainability-related issues and broader emerging challenges that are critical to the success of a business. The process guides companies to apply a sustainability perspective to business by engaging with key stakeholders in risk identification, prioritization, and mitigation, as well as to drive toward emerged business opportunities, allocate resources and set goals. As climate change is considered as one of our 7 strategic focus, we establish multi-disciplinary process to conduct thorough assessment on the climate-related risks and opportunities, and its implications to our business.

We engaged relevant stakeholders to assess climate-related issues, both transition and physical risk aspects and performed a scenario analysis to assess financial risks and opportunities that may have caused by climate change. Apart from the stakeholder engagement, we have also conducted the climate-related risks research through industry association & peers review, executive engagement, and local agency engagement. The scope of our risks and opportunities assessment includes our operations as well as upstream and downstream activities such as the impacts on suppliers and customers, within different timeframes consistent with the expected lifetime of the assets or activities (Short term: 0-1 years, Medium term: 2-5 years, Long term: 6-30 years). For physical risks, location-specific information of the operations and assets was considered, while, for transitional risks, potential changes in legislation, technological development or market conditions are included. The process allows us to understand its potential impacts on our business strategy, operation, and financial implication in aspects such as increasing operational cost from an impact of physical risks, potential streams of income from new market opportunities enabled by the need to mitigate impacts from natural disaster and increasing capital expenditures from transitioning to the lower-carbon business operation (Further details of these implications are illustrated in Part 3: strategy).

### **Climate-related risk identification and assessment process**

Given that this is our initial steps in learning the evolving nature of this issue, our detailed processes to tackle with climate-related risks now focus on major flooding, which is identified as the one of the material risk events. The documented processes in Enterprise Business Continuity Plan (BCP) to tackle such events are outlined below;

1. AIS conducts climate-related risk identification and assessment toward AIS operations annually to inform climate risk at enterprise level.
2. The results from climate-related risk identification and assessment are used by risk management working group, then risk management committee to conduct enterprise risk management. Refer to process in Annual Report 2022 page 49
3. AIS management approach and mitigation actions of climate risks and opportunities are addressed and communicated. Refer to Sustainability report 2022 under topic Climate Actions.
4. For the identified significant climate risk, i.e. major flooding, the adaptation plan and process to manage is addressed in BCP.

## Part 3: Strategy

AIS acknowledges that climate-related issues create significant risks and opportunities for our businesses and strategy. Despite not being in the industries directly contributing to global warming, AIS' provision of services requires utilization of electricity produced mainly from fossil fuels including natural gases and coal as there are still limited clean renewable energy sources, particularly in Thailand. Moreover, we are concerned about the risks from natural disasters which have become more severe and unpredictable, potentially affecting the network infrastructure and subscribers, as well as the transition risks from regulatory changes due to the country's new goals towards the net-zero emissions by 2065.

In order to mitigate such risks and embrace business opportunities arising from the transition towards the low-carbon economy, the climate-related issues are incorporated into our strategic planning, business operations, and risk management process by aligning to the Taskforce of Climate-related Financial Disclosures (TCFD) recommendations. We have adopted TCFD framework in our risk management. Internationally accepted models and scenarios are used to perform scenario analysis on our operation that could be impacted by both physical and transition risks to project possible implications of the climate-related risks and opportunities to our businesses and the financial impacts. This exercise not only helped us understand potential climate-related risks and opportunities, but also encourages us to formulate adaptation and mitigation plans that align with the climate scenarios, from below 2°C scenario up to 5 °C scenario. This will be our significant steps towards achieving the low-carbon economy and sustainable growth.

The table below illustrates an overview of the preliminary implications of climate-related issues on our strategy, operations, and financial planning. The scope of assessment covers AIS operations as well as upstream and downstream activities. The timeframe of impact covers short term (0-1 years), medium term (2-5 years) and long term (6-30 years).

Table 1: An overview of the implications of climate-related issues on our strategy, operations, and financial planning.

Issues	Time horizon <sup>1</sup>	Description		Affected financial items
<b>Transition risks</b>				
		<b>Risks</b>	<b>Opportunities</b>	
Policy and regulatory change	Medium-long term	<p><b>1. Upcoming Thailand's Climate Change Act</b> The Thai government is revising the draft of the Climate Change Act for Thailand. The enactment of the new Act may lead to the following implications;</p> <ul style="list-style-type: none"> <li>- increased costs of carbon emission if cap-and-trade policy or carbon tax is imposed</li> <li>- increased capital expenditure and/or operating cost to upgrade the energy efficiency of the equipment and new technology that helps offset the carbon emission.</li> <li>- compliance cost to new regulation and emission reporting obligations.</li> </ul>	<p><b>2. The government's policy incentives</b> to support renewable and energy-efficient projects will help lower the cost and improve the risk/ return profile of our investment in solar panels and energy-saving technology.</p> <p><b>3. The government's policy to enforce lower emission</b> will create opportunity to AIS in providing digital solutions that help businesses to monitor and manage their energy usage and reduce GHG emissions more efficiently</p>	<ul style="list-style-type: none"> <li>- Capital expenditure</li> <li>- Operating costs</li> <li>- Value of assets</li> <li>- Revenue</li> </ul>
Current regulation & litigation	Short-medium term	<p><b>4. Climate litigation</b> is on the rise globally. However, Telco industry is not a major contribution to the global emissions hence the probability of risk from climate litigation is low.</p> <p>Moreover, we strictly follow the current regulations related to climate change such as the Enhancement and Conservation of National Environmental Quality Act</p>		<ul style="list-style-type: none"> <li>- Other expense (fines, legal cost, settlement cost)</li> </ul>

<sup>1</sup> Short term: 0-1 years, Medium term: 2-5 years, Long term: 6-30 years

Issues	Time horizon <sup>1</sup>	Description		Affected financial items
		<u>Risks</u>	<u>Opportunities</u>	
Technology	Medium-Long term	<p>5. The replacement of existing technology and equipment such as upgrading rectifiers and the installation of solar panels at the data centers, base stations, and switching centers, requires high upfront costs to transition to lower emission and energy-efficient technologies in the medium term.</p>	<p>6. New innovation and more cost-efficient renewable technologies could help decrease the investment cost in the long run.</p> <p>7. Development on digital technologies that supports lower operating cost enlarges the market demand for telecommunication connectivity</p>	<ul style="list-style-type: none"> <li>- Capital expenditure</li> <li>- Operating costs</li> <li>- Value of assets</li> <li>- Revenue</li> </ul>
Market	Short-medium term		<p><b>8. New market for digital services enabled by the need to mitigate impacts from climate change and natural disaster.</b></p> <p>As corporate customers are increasingly aware of climate-related risks, services such as co-location of IT server and storage, Cloud and Data center have become increasingly important businesses due to the need to reduce risks from climate change and natural disaster.</p> <p>9. Market opportunity for low-carbon services</p> <ul style="list-style-type: none"> <li>- Increased demand for digital services will be boosted by our existing Telecom network stability and product/ service reliability. Smart solution service is another market opportunity to enable corporate clients to meet needs in managing their work processes to enhance energy efficiency as a means to reduce GHG emissions.</li> </ul>	<ul style="list-style-type: none"> <li>- Revenue</li> </ul>

Issues	Time horizon <sup>1</sup>	Description		Affected financial items
Reputation	Short-medium term	<p><b>10. Investors and customers’ expectations on the company’s climate-related strategies and performances</b></p> <p>- If the company fails to demonstrate our efforts and progress on appropriate measures to minimize, our brand could be perceived negatively.</p>	<p><b>11. Increased demand for low-carbon and environmental-friendly products and services</b></p> <p>- The Full E concept through e-bills, e-receipts, and myAIS application, which allows customers to manage their accounts by themselves, helps improve the customer experience, as well as benefit the company’s environmental reputation.</p>	<ul style="list-style-type: none"> <li>- Revenue</li> </ul>
<b>Physical risks</b>				
Acute	Short-long term	<p><b>12. Extreme and severe weather such as flood and drought could disrupt our operation and supply chain.</b></p> <p>- Since telecommunication and digital services have become the lifeline of every aspect of people’s personal and professional lives, our customers expect our services to operate regardless of weather conditions. This could incur higher operating cost to properly respond to adverse weather situations.</p>		<ul style="list-style-type: none"> <li>- Capital expenditure</li> <li>- Operating costs</li> <li>Value of assets</li> <li>- Revenue</li> </ul>
Chronic	long term	<p><b>13. Change in weather pattern such as chronic higher temperature and change in rainfall pattern could affect our operations such as investment for higher resiliency of base station and telecommunication equipment and data center where the cooling system is the key.</b></p> <p>- Air-conditioning system and water cooling system might need a replacement to better heat resistant technology. This could also lead to the increased energy usage to power the cooling system.</p>		<ul style="list-style-type: none"> <li>- Capital expenditure</li> <li>- Operating costs</li> <li>Value of assets</li> <li>- Revenue</li> </ul>

## Part 3: Strategy (continued) – Scenario analysis

From the 13 implications of the climate-related issues listed in table 1, we have conducted further analysis on the following 3 implications to assess potential risks and financial impacts, and formulate the adaptation and mitigation plans accordingly.

### **1. Physical Risks: the case of major flooding**

According to Climate risk country profile from the World Bank<sup>2</sup>, floods are by far the greatest natural hazard facing Thailand in terms of economic and human impacts. The combination of rising seas and sinking land, as well as potential cyclone-induced storm surge resulted from the climate change impact, also place the country's capital Bangkok in a precarious position. Therefore, we choose the likelihood and potential impacts from flooding on our operation to perform scenario analysis to evaluate the financial impacts and our company's resilience under the major flooding circumstances. The scope of analysis covers AIS operations as well as upstream and downstream activities. Geographical locations of 100% of our operations are taken into consideration over 10-year timeframe which corresponds with asset lifetime.

#### **Assumption and scenario**

Our scenario analysis uses Share Socioeconomic Pathways (SSPs)<sup>3</sup>, which can be considered in combination with Representative concentration Pathways (RCPs) climate model. While RCPs describe different levels of greenhouse gases that might occur in the future, SSPs also consider socioeconomic factors such as population, economic growth, education, urbanisation and the rate of technological development. The objective of this report is to assess the impact of rainfall<sup>4</sup> under three climate scenarios;

1. **SSP 126:** this scenario describes an increasingly sustainable world and aligns with RCP 2.6 where the carbon dioxide (CO<sub>2</sub>) emissions start declining by 2020 and go to zero by 2100. Consumption is oriented towards minimizing material resource and energy usage. This scenario is likely to keep the global temperature rise below 2 °C.
2. **SSP 245:** this scenario aligns with RCP 4.5 and describes a medium pathway where there is a certain cooperation between states, but it is barely expanded. Income trends in different countries are diverging significantly. Environmental systems are facing a certain degradation. Emissions in RCP 4.5 peak around 2040, then decline. The global temperature rise could range from approximately 2.5 °C to 3.0 °C
3. **SSP 585:** This scenario aligns with RCP 8.5 where emissions continue to rise throughout the 21<sup>st</sup> century. The social and economic development is based on an intensified exploitation of fossil fuel resources with a high percentage of coal and an energy-intensive lifestyle worldwide. So the temperature rise under this scenario could possible go up to 5 °C and is taken as the worst case of the climate scenario.

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<sup>2</sup> World Bank Country report

<sup>3</sup> Explanation of the SSP scenarios comes from the German Climate Computing Center  
<https://www.dkrz.de/en/communication/climate-simulations/cmip6-en/the-ssp-scenarios>

<sup>4</sup> The climate impact on annual rainfall of Thailand is analyzed by the Hydro-Informatics Institute of Thailand, using different SSP scenarios.



These three scenarios are applied to assess **the likelihood of major floods** in each area of Thailand by using the following factors;

- Seasonal maximum 1-day rainfall to consider the likelihood of abrupt flooding in case of heavy rain throughout the day<sup>5</sup>
- Seasonal maximum 3-day rainfall to consider the likelihood of prolonged floods due to consecutive wet days.
- Criteria for warning areas, which are divided into Cautious area, highly cautious area, and crisis area, are considered from the amount of rainfall, geographical location, the height of a location.
- Flood-prone areas identified by historical data<sup>6</sup>

These factors are input into our risk model and the results of the likelihood assessment are considered in accordance with the 5 levels of risk rating in the company's risk matrix.

		<b>Risk rating (Likelihood)</b>
	Red	Very high
	Orange	High
	Yellow	Medium
	Green	Low
	Light green	Very low

Apart from the likelihood of flooding, we also consider the impact from flooding by using the following factors;

- Loss and costing from property and asset damages, using the Netbook Value of asset in each location, displayed the value in Thai Baht
- Revenue loss per month, using estimation of current revenue generation from mobile network of each base station.

### **Results of scenario analysis**

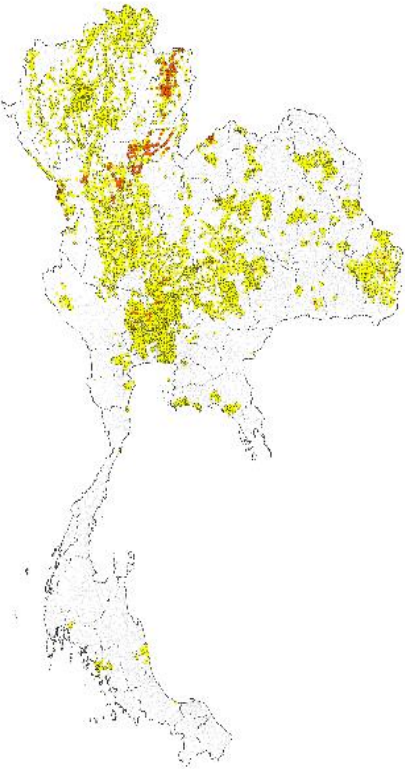
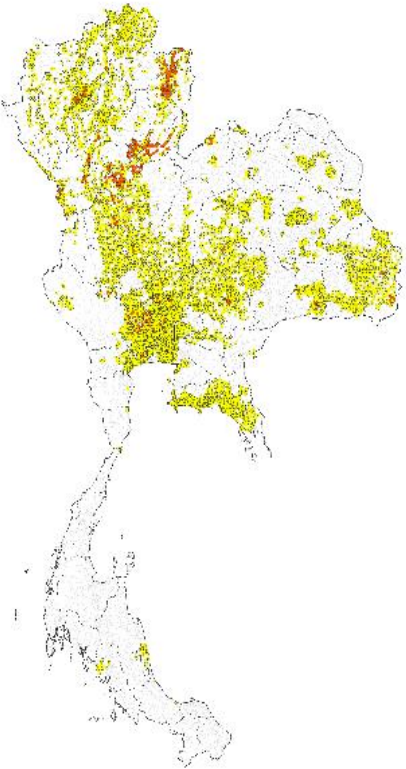
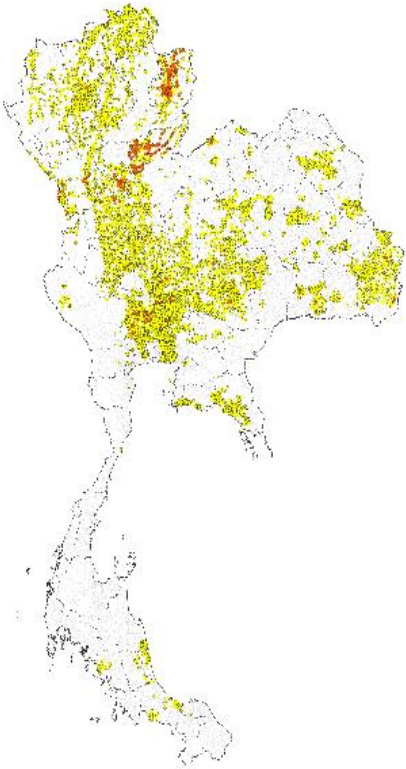
The results from the table below show that physical risk from flooding could affect many areas in Thailand, especially the central region, and might cause damages to our base stations, ranging between 8,100 and 10,300 base stations nationwide, depending on the scenarios with temperature ranging from 2 °C to 5 °C. The financial implication from asset damages could range between THB 13,000 million and THB 17,000 million. And if the affected base stations could not operate due to the damages, we estimate that it would lead to revenue loss per month, ranging from approximately THB 2,133 million to THB 2,861 million. Results of flooded areas and the financial impacts in each scenario are illustrated in the table below.

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<sup>5</sup> Projection of the amount of rainfall is calculated by the Hydro-Informatics Institute of Thailand

<sup>6</sup> Data of flood-prone areas comes from Department of Water Resource of Thailand

Table 2: Summary of the impacts from flooding on the base stations and the financial implications (Near future 2015 – 2039)

Scenario	SSP126	SSP245	SSP585
<b>Affected areas and base stations (medium to high risk levels)</b>			
Risk Map			
Number of sites in risk area	8,193	10,349	8,267*
<b>Financial impacts (Million THB)</b>			
Asset damage (calculated from Netbook value)	13,329	17,186	13,360
Revenue loss per month**	2,171	2,861	2,133

\*Given that the 5 °C scenario would cause extreme heat, therefore, the risk of flooding is less in this scenario.

\*\* Revenue per month is calculated from mobile network revenue only

Since telecommunication and digital services have become the lifeline of every aspect of people's personal and professional lives, our customers expect our services to operate regardless of weather conditions. Besides, keeping a channel to work with our dealers is also important for our services to run smoothly despite the impact from flooding. Preventing major disruption of our services from the severe weather events could incur higher capital expenditure and/or operating cost to properly respond to adverse weather situations.

Apart from our business operation, supply chain disruption caused by major floods is also taken into consideration. Major floods might damage telecommunication and network equipment for our network expansion or maintenance stored in suppliers' warehouses. To mitigate such risks, investment for preventive actions in short to long terms have been planned. Our risk management approach consists of the following actions;

### **Adaptation and mitigation**

#### Short to medium term action plan (0-1 and 2-5 year, respectively)

- 1) Preparing both the Incident Response Plan and the Business Continuity Plan to cover main infrastructure, base stations, principle node, and data centers. These preparations include standard designs, operational routine, and crisis response process.
- 2) Elevating the Mobile Base Station (BTS) in flood-prone areas by 1.5-3.0 meters and building the flood-wall for the Mobile Switching Centers (MSC) where vulnerable to flooding.
- 3) Preparing back-up electricity generators for BTS and small movable/mobile BTS to maintain services in critical areas in order to further reduce the impact from network interruption to customers and risk to potential revenue loss
- 4) Increasing solar cell capacity which will serve as an alternative source of power at our operation locations and data center when the extreme weather events disrupt the main power source.
- 5) Installing weather warning system to monitor flood.
- 6) For upstream activities, partnering with major suppliers to find alternative locations for evacuating the equipment when a high risk from flooding is identified.
- 7) For downstream activities, using online channels to work with our dealers in order to keep our operations to run smoothly
- 8) For customers, providing convenient channels for customer self-service. For example, myAIS mobile application serves as a one-stop service platform that allows customers to use our services and manage their accounts conveniently.

In the long run, we will take the result of this analysis into consideration in 100 % of new facility siting in order to avoid building new stations in the flood-prone areas and design improved parameters for the new stations. With all these preventive actions, impacts from flooding risk has decreased significantly to very low likelihood and impact over the next 7-8 years.

## **2. Transition Risks (policy and regulatory change): the case of carbon pricing**

The Sixth Assessment Report (AR6), released by the Intergovernmental Panel on Climate Change (IPCC), has prompted global action to revise the GHG emission reduction target to limit the warming level of 2 degrees down to 1.5 degrees Celcius above pre-industrial temperatures. For its part, Thailand has also taken part in the efforts. At the UN Climate Change Conference (COP26), Thailand pledged to accelerate action to achieve carbon neutral by 2050 and the net-zero emissions by 2065 out of the concern that Thailand is one of the top 10 countries most affected by climate change and to join the

global community in immediate efforts to fight climate change. Following Thailand’s national climate pledge, the Thai government has proposed a new law on climate change and modified the National Energy Plan to ready the country toward the goal of net zero. The draft aims to lay out Thailand’s action plan for climate change mitigation and adaptation, including emissions reductions. The government announced in 2022 that this law will provide both regulatory measures, such as stricter emission standards, and incentive mechanisms, such as a carbon tax and carbon credit, to help promote a climate-friendly investment and voluntary carbon market. Although the details of the Act remain unclear, it is likely that every industry in Thailand will get affected by this Act once it comes into force.

Given this background, our scenario analysis on transition risks is based on possible regulatory changes and increasing carbon prices due to the transition to achieve the climate goals. We consider the trend of carbon price, projected by the International Energy Agency and its impact on our financial performance in 2030 and 2050 based on the 2 following scenarios<sup>7</sup>;

Scenario	Description	Emission reduction by 2030	Carbon price (IEA projection)
1. Net-zero emission by 2050	A scenario which sets out a narrow but achievable pathway for the global energy sector to achieve net zero CO <sub>2</sub> emissions by 2050. It does not rely on emissions reductions from outside the energy sector to achieve its goals.	42% from the base year	USD25 per tonne of CO <sub>2</sub> (Price of emerging market)
2. Announced Pledges Scenario	A scenario which assumes that all climate commitments made by governments around the world, including Nationally Determined Contributions (NDCs) and longer-term net zero targets, will be met in full and on time.	40% from BAU case	USD40 per tonne of CO <sub>2</sub> (Price of emerging market)
3. Stated Policies Scenario	A scenario which reflects current policy settings based on a sector-by-sector and country by country assessment of the specific policies that are in place, as well as those that have been announced by governments around the world.	40% from BAU case	USD28 per tonne of CO <sub>2</sub> (Price of China) <sup>8</sup>

<sup>7</sup> <https://iea.blob.core.windows.net/assets/3a51c827-2b4a-4251-87da-7f28d9c9549b/GlobalEnergyandClimateModel2022Documentation.pdf>

<sup>8</sup> The reference carbon prices for the Stated Policies Scenario do not include the price from emerging market. we choose the price from China market as China’s National Goal (Net-zero emissions in 2060) is somewhat aligned with the Thai National Goal (Net-zero emission in 2065).

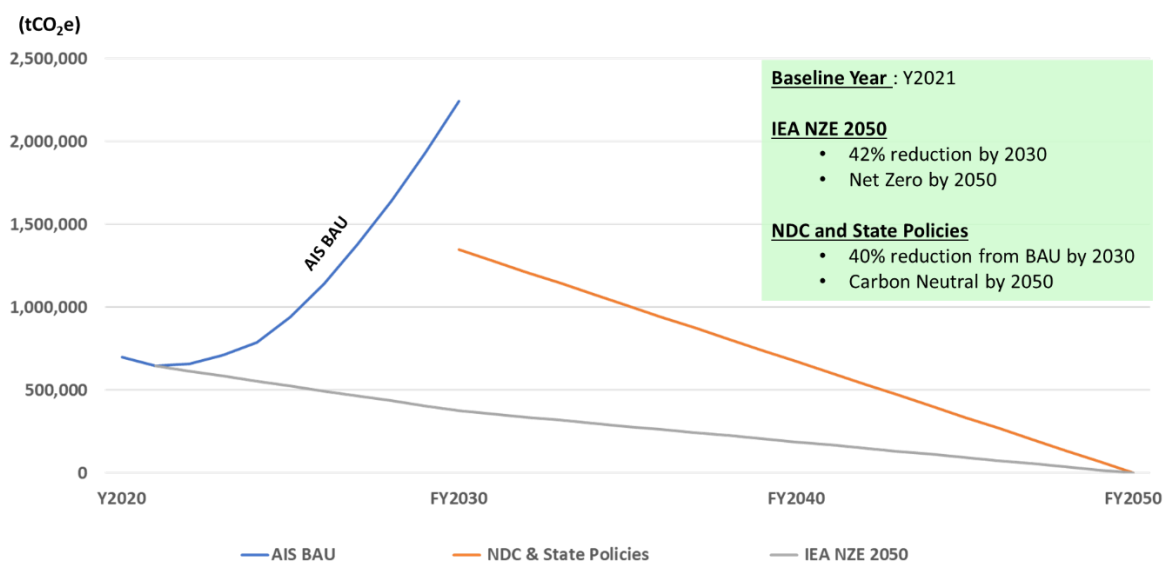
In order to support the National commitment, AIS, a leading digital service provider, should play a significant role in achieving the transition to the lower-carbon economy by internalizing the negative impacts we may have caused to the environment. Moreover, it is important to apply this responsible practice to our suppliers to reduce AIS' indirect negative impacts caused by our suppliers. Due to growing demand for digital services and hence telecommunication connectivity, the electricity usage to power our networks and data centers, which is a major contribution to our GHG emission, shows an upward trend along with the rising demand. The incurred cost from internalizing negative impacts from our carbon emission could become another major transition risk that we need to properly manage.

Therefore, we study the trend of our GHG emissions by using linear regression to predict the trend and explore how it will affect our financial planning. Since Thailand does not have carbon tax or trading schemes, our scenario analysis is drawn from an assumption that the government could strongly encourage telecommunication industry to reduce the absolute amount of greenhouse gas emission. Had not AIS conducted any mitigation action, our financial performance could have been impacted by the increasing carbon price. According to the above-mentioned scenarios from the International Energy Agency, we formulate a projection of incurred cost from an assumption that the company have to pay for the exceeding amount of GHG emission, with the carbon prices under 3 following scenarios: 1) Net-zero emissions by 2050 with the carbon price at USD25 per tonne CO<sub>2</sub>, 2) Announced Pledges Scenario at the price of USD 40 per tonne CO<sub>2</sub>, and 3) Stated Policies Scenario at the price of USD 28 per tonne CO<sub>2</sub>. The total financial cost of our emission in 2030 for each scenario is illustrated in the table below.

### Estimated financial implications

Scenario	Carbon Tax (THB)
IEA NZE 2050 (Emerging MKT)	981,720,379.29
Announced Pledges	1,256,768,665.37
State Policies	879,738,065.76
<b>1USD = 35 THB</b>	

### Trajectories of absolute emissions reduction across climate scenarios



**Remark:** the announced pledge is equivalent to NDC as it takes account of all of the climate commitments made by governments around the world, including NDCs as well as longer term net zero targets. (Source: IEA, World Energy Model Documentation, October 2021).

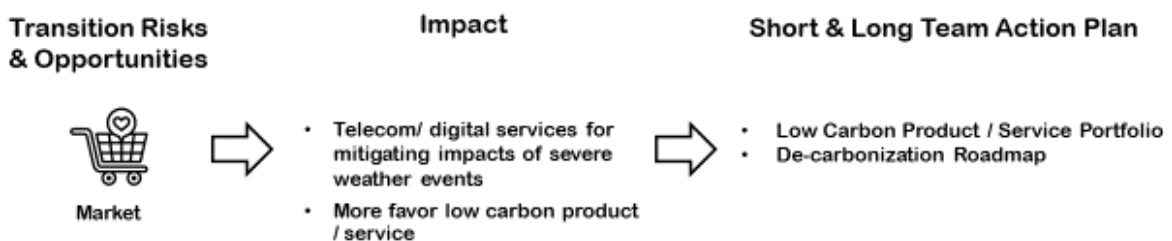
It is noteworthy that the increased carbon price may occur at the electricity provider and passed through AIS as an energy consumer by embedding in the electricity cost or AIS may have to pay for the offset, carbon credit or tax directly. In terms of consumer, the price of our service may not significantly increase, thus, an insignificant impact from is expected on the market share. This also because, AIS will likely continue to be among the top market leaders who provide the best-in-class telecommunication service to the market.

**Mitigating actions**

- Review our environmental target and deploy various initiatives such as enhancing network efficiency and investing in renewable energy, which will help reduce our emissions to mitigate future climate-related risk to AIS operations.
- Enhance knowledge and internal capacity building on low-carbon and avoided-emission products and services to increase business opportunities.
- Regularly review the allocation of capital and cost structure among various businesses and take into account possible cost from regulatory changes.
- Encourage our suppliers to be more environmentally friendly through our green procurement policy, and collaborate with them to improve network operation efficiency hence reducing the emissions
- Collaborate with business partners and suppliers to develop digital solution services to enable corporate clients to work more efficiently, enhance energy efficiency hence reducing their emissions.
- Exploring various initiatives to cut our residual emissions such as offsetting by purchasing carbon credits from authorized agencies and investing in reforestation through Thailand Voluntary Emission Reduction Program (T-VER), initiated by Thailand Greenhouse Gas Management Organization (TGO).

The mitigating actions has reflected in the CAPEX of THB1,434 million for 2019 to 2023.

**3. New market opportunity arising from the need to manage impacts from natural disaster**



Following the climate change issues, the natural disaster has become more severe and more difficult to predict, particularly flooding that happens in several provinces in Thailand. Thus, more corporate customers have started to outsourcing their IT infrastructure and services e.g. co-location of IT server and storage, managed services such as Cloud and Data center to reduce risks from such incidents. AIS provides secured infrastructure (i.e. Tier-4 Data Centers) along with Business Solutions for enterprise customers ranging from cloud solutions, back-up services, disaster recovery site, co-location of server to software as a service.

Furthermore, digital solutions also have significant roles to enable decarbonization. One of important contributions that a digital service provider can help address climate issues is to support other sectors of the economy reduce their carbon emissions through digitization. Therefore, AIS has strived to develop smart solution services to enable corporate clients to meet needs in working in the new normal and to manage work processes to enhance energy efficiency as a means to reduce GHG emissions.

These implications represent some significant business opportunities in our 2 core areas (refer to Table 3) for the company to grow its new revenue streams by leveraging our data centers, skills and expertise, IT and our nationwide network infrastructure to provide end-to-end integrated services supporting the growing demand of the enterprise customers arising from climate change.

Table 3: Businesses that could be benefited from the increasing demand due to the need to mitigate risks from severe weather events.

Core business areas	Services that can be provided
Telecommunication connectivity service	<ul style="list-style-type: none"> <li>• Enterprise data services i.e. Business Solution, broadband connectivity for small-medium size business</li> <li>• Machine-to-Machine communication</li> <li>• Call Center Outsourcing Service</li> </ul>
New ICT/digital service	<ul style="list-style-type: none"> <li>• IoT and ICT solution</li> <li>• Cloud &amp; Data Center</li> <li>• Cybersecurity</li> <li>• Digital Marketing &amp; Digital Content</li> </ul>

AIS is in initial phases of assessing our contribution to support enterprise customers to reduce their emissions as the financial opportunity from the avoided-emissions products is growing. For example, Cloud services that cater to the work systems of enterprise clients. AIS Cloud & Data Center are designed to be highly energy efficient and feature the latest high energy-efficient equipment, making the use of AIS service more environmentally friendly than investing in clients’ own data servers & hosting equipment. Furthermore, AIS also promotes the use of renewable energy at the data centers to make it more environmentally friendly. In 2022, the proportion of solar energy used at the data centers is 1.74% of the total energy consumption. This can be considered that we have helped our cloud services customers to avoid emitting the emissions by 730 tCO<sub>2</sub>e.

**4. Increased demand for low-carbon and environmental-friendly products and services**

One of the main self-service channels that AIS has been promoting is a mobile application called MyAIS. It has been upgraded to provide greater convenience as a one-stop application, its Express Service function provides wide range of services as an AIS Shop while its AI assistant Aunjai provides personalized End-to-End support 24 hours a day. The myAIS application also retails SIM cards and facilitates application for AIS Fibre home internet, providing convenient channel for existing customers to take on further AIS services. This online channel allows customers to manage their accounts by themselves, helps improve the customer experience, as well as benefit the company’s environmental reputation.

Through our Digital Service, it is clear we are dedicated to improving online services for customers and reducing their need to travel to shops which contributes to:

1. Reduction of GHG emissions into the atmosphere (calculations based on fuel usage in travel, conceptual framework can be set)
2. Reduction of paper usage through the use of E-Bills that further cut emissions

By the end of 2022, my AIS usage reached 9.7 million users, increasing by 16%. Moreover, 111 million bills switched from mailed bills to E-Bills and 109 million E-Receipts all together cutting the need for sheets of paper and reduce fuel use from traveling to locations of service centers, equivalent to 14,994 tCO<sub>2</sub>e in GHG emissions a year.

We will continue to improve customer experiences from using the online service channels as we consider this low-carbon service as one of our climate strategies. Expansion of these approaches will lead to a greater reduction in GHG emissions, which can be tracked based on online transactions carried out by customers and E-Bill quantities.

## Part 4: Metrics and Target

### Targets

AIS believes our goals demonstrate to our stakeholders that we are committed to internalize our negative externalities, while also managing possible risks and opportunities arising from the climate change. Our commitment involves 2 key main approaches.

#### **Short- to medium-term targets (2023)**

- Reduce GHG emissions intensity as calculated from the ratio of direct (GHG scope 1) and indirect (GHG scope 2) emissions to data traffic (tCO<sub>2</sub>e/terabit or ton carbon dioxide equivalent per terabit) by 90% compared to the baseline in 2015.
- Increase renewable energy usage to 5% of total energy consumption

#### **Long-term target**

- Achieve net-zero emissions by 2050

### Progress and performance

Despite its energy usage increasing due to network expansion and growing demand for data, AIS has still been able to limit its GHG emission intensity relative to the amount of data it supplies, underlining the efficiency of its network's design and utilization. Promoting a higher proportion of renewable energy, AIS in 2022 was able to reduce GHG emissions intensity, a ratio of GHG emissions to data traffic, by 91 percent compared to the base year 2015, which has made us achieve our short-term target. At the same time, AIS increased its proportion of renewable energy usage to 1.73 percent of total energy used, compared to 1.23 percent in 2021 thanks to our efforts in installing more solar panels at base stations, data centers, and mobile switching centers. During 2022, we have installed solar panels at 3,190 more locations. This resulted in a total of 8,751 base stations, data centers, and mobile switching centers using electricity from renewable sources, reducing greenhouse gas emissions by 12,094 tCO<sub>2</sub>e.

We also recognize that assessing the emissions across our value chain is critical for formulating the strategy and decarbonization roadmap. Therefore, this is the first year that we are assessing our Scope 3 emissions following the methodological guidelines of the GHG Protocol. At this initial phase of the Scope 3 assessment, we report 4 categories and will continue to improve the Scope 3 baseline as this assessment will be a significant step for engaging with our suppliers and customers to reduce emissions throughout the value chain.

Implications and financial impacts from climate change are evolving issues that need to be further explored to develop finer methodologies to better quantify the degrees of climate-related risks and



opportunities on our business and strategy. Our TCFD report is only an initial step to demonstrate to our stakeholders that we are committed to reducing our environmental impact. And, we will continue to measure and disclose our performance against our targets. See more details of our key actions to respond to climate change in the sustainability report 2022, pages 78-86

<https://sustainability.ais.co.th/storage/sustainability-report/2022/20230221-advanc-srd-2022-en.pdf>

Table 4: Our metrics and performance

Subjects	Unit	2019	2020	2021	2022	Target 2022
<b>GHG Emission</b>						
<b>Total GHG emissions (Scope 1 and 2)</b>	tCO <sub>2</sub> e	615,407	696,883	645,321	675,497	660,050
<b>Scope 1 - Direct GHG emissions<sup>1</sup></b>	tCO <sub>2</sub> e	11,177	11,196	8,931	7,411	8,600
<b>Scope 2 - Indirect GHG emissions<sup>2</sup></b>						
• Location-based	tCO <sub>2</sub> e	604,230	685,687	636,390	668,086	651,450
• Market-based	tCO <sub>2</sub> e	604,230	685,687	636,390	668,086	
<b>Scope 3 - Indirect GHG emissions<sup>3</sup></b>						
• Category 1: Purchased goods and services	tCO <sub>2</sub> e				234,742	
• Category 2: Capital goods	tCO <sub>2</sub> e			15,259	75,985	
• Category 3: Fuel- and Energy-Related Activities not included in Scope 1 or Scope 2	tCO <sub>2</sub> e				89,963	
• Category 7: Employee commuting	tCO <sub>2</sub> e			1,198		
• Category 11: Use of sold products	tCO <sub>2</sub> e			116,157	55,848	
<b>GHG Intensity<sup>4</sup></b>	tCO <sub>2</sub> e per Terabit	0.025	0.02	0.015	0.01	
<b>Energy</b>						
<b>Total Energy Consumption</b>	MWh	<b>1,082,823</b>	<b>1,220,024</b>	<b>1,318,495</b>	<b>1,394,989</b>	
	Terajoule	<b>3,898</b>	<b>4,392</b>	<b>4,747</b>	<b>5,022</b>	
<b>1) Total non-renewable energy consumption</b>	MWh	1,081,960	1,214,006	1,302,213	1,370,769	1,334,195
	Terajoule	3,895	4,371	4,688	4,935	

Subjects	Unit	2019	2020	2021	2022	Target 2022
• Direct energy consumption: Fuel and other <sup>5</sup>	MWh	36,706	36,052	29,178	34,356	
	Terajoule	132	130	105	124	
• Indirect energy consumption: Electricity <sup>6</sup>	MWh	1,045,254	1,177,954	1,273,035	1,336,440	
	Terajoule	3,763	4,241	4,583	4,811	
2) Total renewable energy consumption	MWh	862.91	6,017.86	16,282	24,193	22,924
	Terajoule	3.11	21.66	58.62	87.09	
• % Energy from renewable sources	%	0.08	0.49	1.23	1.73	
Power Usage Effectiveness (PUE) at Data Centers <sup>7</sup>	Unit	1.61	1.56	1.51	1.505	1.51
Total energy consumption in data centers	MWh	59,015	70,182	77,261	83,851	
• % Energy from renewable sources in data centers	%	0.94	1.02	1.57	1.74	1.65
Energy cost	Million baht	4,443	4,853	5,138	5,798	

Remarks

1. GHG emissions result from the burning of fuels, vehicles, power generators, coolant leakage and carbon dioxide type fire extinguishers. Emission factor and Global Warming Potential (GWP) values used in the calculation are based on a 100-year time frame indicated in the Fifth Assessment Report (AR5) used by the Inter-Government Panel on Climate Change (IPCC). The GHG Inventory Calculation tool is from the Thailand Greenhouse Gas Management Organization (TGO). The consolidation approach used in this report is 'operational control'.
2. The source of Indirect GHG emissions (Scope 2) comes from the national grid so the reported data for location-based and market-based are the same.
3. Significant improvements were made to our Scope 3 assessment in 2022, employing GHG protocol methodologies and gathering data at a more granular level, resulting in substantial variations between the 2021 and 2022 data sets. These changes in calculation methodology and data coverage account for the observed differences.
4. GHG Intensity is the ratio of GHG per data traffic generated the whole year. It is specific for telecommunication industry which shows efficiency of the emission by stating how much GHG is emitted for every terabit of generated traffic.
5. Direct energy consumption results from fuel for operation vehicles and backup generators. The monthly collected data in liters are derived to obtain energy by a conversion factor provided by Department of Alternative Energy Development and Efficiency (DEDE).
6. Indirect energy consumption is from electricity used in the business including network operations. Data is compiled to total MWh of usage through either Metropolitan or Provincial Electricity Authority billing, which is recorded in the system.
7. Power Usage Effectiveness (PUE) is a metric to measure efficiency of data centers. PUE is defined as total energy used in a data center divided by the usage of the IT equipment load that such data center serves.