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Preparing, Procuring and Implementing Climate-Smart PPPs

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This section provides an overview of climate change considerations in PPP projects, including climate risk assessments, procurement, contracts, and insurance.

While infrastructure, such as roads, hydropower projects and water treatment plants, contributes to a large extent to climate change, infrastructure and its services may also become increasingly affected by climate change-related extreme weather events as well as by gradual, longer-term incremental changes. It is therefore essential to incentivize investment in low-carbon PPPs and to ensure that changing climate conditions, disaster risk and potential climate change mitigation and adaptation measures are identified and considered during the development, design and implementation of each individual PPP project.

As a resource site the Public-Private Partnership Resource Center highlights in particular legal resources that are relevant for the integration of climate change considerations during the PPP project cycle. Detailed strategies for integrating climate-resilient principles into the main stages of the PPP project cycle are outlined in Climate Resilient Infrastructure Officer Handbook: Knowledge Module on Public-Private Partnerships for Climate-Resilient Infrastructure (Module 5 - Embedding resilience in the framework of a PPP).
A more comprehensive list of tools that can be used to embed climate resilience into PPP projects can be found in Climate-Resilient Public Private Partnerships.

Climate Risk Assessments

Assessing the impacts of climate change on infrastructure projects and establishing appropriate plans to reduce their carbon emissions and to ensure that they are more resilient towards outer shocks and stresses are key preconditions for climate-smart PPP projects. To enhance sustainability and resilience all preliminary studies and assessments undertaken during the project preparation stage, such as feasibility studies, value-for money an cost-benefit analyses, should take climate considerations into account. This requires dealing with uncertainty and using forecasting models that go beyond estimations based solely on historic data and trends.

Using climate considerations as a parameter when conducting a **value-for-money (VfM)** or **cost-benefit analysis:**

According to Resilient Infrastructure Public-Private Partnerships (PPPs): Contracts and Procurement – The Case of Japan, World Bank 2017, Sendai City considers resilience and business continuity in VfM analysis by comparing two scenarios: (i) one in which the project is handled by a public administrator; and (ii) one in which a private operator builds and operates the facility under a build-operate-transfer (BOT) scheme. In the second case, disaster response would require less time and fewer resources form Sendai City to evaluate damage, apply for a contingency budget, and submit documents to the municipal assembly.

Environmental (and social) impact assessments

Environmental impact assessment (EIAs) or environment and social impact assessments (ESIAs) undertaken, e.g. as part of a feasibility study, are typically used to identify and assess climate change impacts of a project

as well as potential mitigation and adaptation measures. The findings can then be used as a basis for adjusting existing modalities for project design, approval, and implementation to avoid and/or minimize harm and to improve environmentally sustainable outcomes.

For sample requirements see the respective legal documents below:

Case Studies

The Global Facility for Disaster Reduction and Recovery (GFDRR) include country information on disaster risk management and key socioeconomic sectors that can be used to understand sector risk.

Climate Risk Case Study - Hydro - Himal Nepal, IFC 2011 -This report presents the outcomes of a study analyzing the potential risks from climate change for the Khimti 1 run of the river hydro-electric power scheme in Nepal, owned and operated by the Himal Power Ltd (HPL) and proposes adaption (risk management) options for HPL to consider. The report identifies also a number of lessons for future hydro-power production in Nepal.

Climate Risk Case Study - Hydro – Zambia, IFC 2011- Hydropower projects may be highly sensitive to climate change impacts. This study analyzes the KGL HP project in the Kafue basin in Zambia. Major components of the study include development of downscaled temperature and precipitation projections for the basin, modeling of hydrologic flows in the Kafue river, modeling of corresponding reservoir and energy outputs, analyses of financial implications, and considerations of natural hazards and other uses of water in the study area.

Climate Risk Case Study – Ports – Colombia, IFC 2011 - Physical infrastructure at ports and port activities may be highly vulnerable to changes in climate. To understand the significance of these risks for a given port, this study assesses risks and opportunities for ports in general, and specifically for IFC's client, Terminal Marítimo Muelles el Bosque (MEB), in Cartagena, Colombia.

Policies, Legislation and Regulation

Many countries have legislation in place requiring some sort of environmental (and social) impact assessment for projects that may have adverse environmental or social impacts and some countries have started taking steps to promote assessments that take climate change considerations into account. Below are some examples:

Regional

European Union

Directive 2011/92/EU of the European Parliament and of the Council (amended in 2014 by Directive 2014/52/EU) requires an assessment of the likely significant environmental effects of certain projects before a development consent is granted. Under Article 5(f) of the 2014 Directive, the EIA process includes an assessment of the impact of projects on climate (for example greenhouse gas emissions) and their vulnerability to climate change.

Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, European Commission – guidance on how to integrate climate change adaptation in EIAs.

Guidance on the preparation of the Environmental Impact Assessment Report, European Commission – guidance on the content requirements of EIA reports, including impacts related to climate change.

See the European Commission website for the complete list of guidance documents and publications relating to EIAs.

Caribbean

Guide to the Integration of climate change adaption in the Environmental Impact Assessment ("EIA") process, Caribbean Community ("**CARICOM**"), South Pacific Regional Environment Programme ("**SPREP**"), and the Canadian International Development Agency ("**CIDA**") 2004 - operational guidance for EIA specialists on how to integrate climate risk management considerations.

The Guide provides that when considering the impacts of climate change, the EIA process should:

- evaluate a project's potential environmental risks and impacts in its area of influence;
- identify and evaluate potential impacts from climate change on the project's area of influence;
- examine project alternatives;
- identify ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating or compensating for adverse environmental impacts and anticipated adverse impacts from climate change, and enhancing positive impacts; and
- include the process of managing and adapting to adverse environmental impacts and anticipated adverse impacts from climate change throughout project implementation.

National

Canada

- To ensure that all projects appropriately consider and incorporate climate change into their design and implementation, federal requirements apply to certain projects under the Investing in Canada Infrastructure Program. According to the note Backgrounder: Applying a Climate Change Lens to Infrastructure Projects published by Infrastructure Canada, applicants seeking federal funding for new major public infrastructure projects will be asked to undertake an assessment of how their projects will contribute to or reduce carbon pollution, and to consider climate change risks in the location, design, and planned operation of projects as part of the Investing in Canada plan. At the planning and design stage, project applicants will now need to assess whether their projects will increase or decrease greenhouse gas emissions. As a second component, they will need to consider ways to incorporate structural or system changes that will help their new infrastructure withstand the potential impacts of climate change and continue to perform reliably. Over time, the goal is to have climate change considerations become a core part of Canada's infrastructure planning.

- In Canada, it has been a requirement for major development projects to incorporate climate change impacts and adaptation in EIAs under the Environmental Assessment Act, 2012, as amended on June 22, 2017. The Environmental Assessment Act was repealed in August 2019 and replaced with the Impact Assessment Act 2019.

  The Impact Assessment Act sets out a process to enable decision-makers to "determine whether the adverse effects within federal jurisdiction – and the adverse direct or incidental effects – that are indicated in the report are, in light of prescribed factors and the extent to which those effects are significant, in the public interest" (s 60(1)(a)). The extent to which the effects of a designated project hinder or contribute to Canada's ability to meet its environmental obligations and its commitments in respect of climate change is one factor in the public interest decision.

- Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol - The Protocol was developed by Engineers Canada in partnership with Natural Resources Canada (NRCan), between 2005 and 2012. The PIEVC Protocol is a structured, rigorous qualitative process to assess the risks and

vulnerabilities of individual infrastructures or infrastructure systems to current and future extreme weather events and climatic changes. Once the risk is identified, adaptation solutions are normally developed to address the high and medium level risks. These can be structural actions that involve "grey" solutions, nature-based solutions, or a combination of both. Although it is not a legal requirement for infrastructure projects in Canada the PIEVC Program Partnership encourages the use of the Protocol for all types of infrastructure going forward. The Protocol has been applied since 2008 to assess climate risks and vulnerabilities across a wide range of infrastructure systems in Canada including roads and associated structures (e.g. bridges and culverts); water supply and management systems; electricity distribution and airport infrastructure. It has been used to assess various types and scales of infrastructure in Canada as well as Costa Rica, Honduras, Brazil, Vietnam and the Nile Basin. For more information on the PIEVC Protocol and its applications, see The PIEVC Protocol for Assessing Public Infrastructure Vulnerability to Climate Change Impacts: National and International Application prepared for the 2021 Canadian Society of Civil Engineers Annual Conference.

For further guidance on the climate lens assessment see Climate Lens, General Guidance, Infrastructure Canada, September 2019.

For provincial climate lens requirements see the for example Department of Municipal Affairs and Environment of Newfoundland.

Philippines

- Public-Private Partnership ("PPP") Governing Board Resolution of December 2018 provides guidelines to ensure that identified safeguard concerns are considered during the feasibility stage and integrated into the project design. This includes safeguards related to climate change mitigation as well as resilience to climate change hazards. Annex C contains prescribed contents of the safeguard chapter of the feasibility study, including climate change and natural hazards resiliency considerations.
- Presidential Decree No. 1586 (Philippines EIS System) outlines the Environmental Impact Assessment ("EIA") Process.
- The Republic Act No. 9729 establishes a framework strategy and program for incorporating climate change considerations into projects. PPP project developments are required to comply with national and/or local climate change action plans.

Scotland

Environmental Assessment (Scotland) Act 2005 – mandates that climatic factors need to be considered throughout Social and Environmental Assessments.

Consideration of climatic factors within Strategic Environmental Assessment ("SEA"), Scottish Environmental Protection Agency ("SEPA") – provides guidance on the consideration of climate change factors within the meaning of the Environmental Assessment (Scotland) Act 2005 when undertaking a SEA.

The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 sets targets to reduce Scotland's emissions of all greenhouse gases to net-zero by 2045, with interim targets for reductions of at least 56% by 2020, 75% by 2030, and 90% by 2040. Furthermore, this Act also requires Scottish Ministers to, when publishing an infrastructure investment plan, publish an assessment of the extent to which investment in accordance with the plan is expected to contribute to the meeting of the emissions reduction targets. The Act amends the existing Climate Change (Scotland) Act 2009, which imposes duties on public bodies relating to climate change. In exercising its duties, a public body must act:

- in the best way calculated to contribute to the delivery of the emission reduction targets;
- in the best way calculated to help deliver any program for adapting to the impacts of climate change; and
- in a way that it considers most sustainable.

United States

- EIA Guidelines for Assessing the Impact of Climate Change on a Project – Columbia Law School, Sabin Center for Climate Change Law has compiled EIA guidelines on the federal , state and local level for assessing the impact of climate change on a project. These guidelines provide instruction for government agencies and project proponents on how to evaluate climate risk in the context of environmental impact assessment (EIA). They are intended to facilitate an assessment of: (i) how climate change may impact a project and its surrounding environment; (ii) the implications that this may have for the performance and environmental consequences of the project; and (iii) the selection of appropriate adaptation and resilience measures to address climate-related risks.

Additional international examples are available on the website of the Columbia Law School, Sabin Center for Climate Change Law.

Standards Applied by International Financial institutions (IFIs)/Development and Commercial Banks

Many IFIs as well as and other national financial institutions address climate change risk and adaptation in their environmental and social safeguards policies, which apply to projects that they finance. Many of these institutions have also developed tools to identify and assess climate change risk.

Some examples are provided below:

- **African Development Bank (AfDB)**
  Integrated Safeguards System, Environmental and Social Assessment Procedures (ESAP), Safeguards and Sustainability Series, Volume 1 – Issue 4, November 2015 - ESAP requires an assessment of greenhouse gas emissions and vulnerability of the asset and its operations to climate change as part of the environmental and social assessment process for its public and private sector operations.
- **European Bank for Reconstruction and Development (EBRD)**
  Environmental and Social Policy of April 2019 - EBRD has integrated a climate change risk assessment into the Environmental and Social Policy and more specifically in its Performance Requirements. The Policy will be reviewed in 2024. The Green Economy Transition (GET) Approach 2021-2025 is EBRD's strategy for helping countries where the EBRD works build low carbon and resilient economies.
- **European Investment Bank (EIB)**
  The EIB's Environmental and Social Standards include climate-related standards. The EIB has adopted a set of 11 environmental and social standards that establish the requirements the promoter and the project must meet throughout the EIB project life cycle.
- **The Equator Principles (EP) Association**
  The Equator Principles – Risk management framework adopted by many financial institutions for determining, assessing and managing environmental and social risk in development projects. They incorporate the International Finance Corporation's (IFC's) Environmental and Social Performance Standards and the World Bank Group's Environmental, Health and Safety Guidelines as the relevant standards that apply to certain projects. The Equator Principles recognize the importance of climate change and aim to avoid negative impacts on project-affected ecosystems, communities, and the climate where possible. If these impacts are unavoidable - they should be minimized, mitigated, and/or offset. Annex A (Alternatives Analysis, Quantification and Reporting of Greenhouse Gas (GHG) Emissions) deals specifically with climate change. Mandatory alternative analysis to evaluate options with lower project-related GHG emissions and/or reporting of carbon-intense projects is required or recommended depending on emission levels.
- **Nordic Development Fund**
  Guidelines for Project Identification and Screening. The Nordic Development Fund (NDF) is a joint Nordic finance institution focusing exclusively on climate change and development in low-income

(LIC) and lower middle- income countries (LMIC). The Guidelines reflect core principles and strategic priorities to underline NDF's role in channeling finance to innovative climate change interventions that reduce poverty in developing countries.

- **USAid**
  Climate-Resilient Development: A Framework for Understanding and Addressing Climate Change offers a five-stage approach to help decisionmakers and development practitioners at all levels systematically assess climate-related risks and prioritize actions that promote climate-resilient development.
- **World Bank Group (WBG)**
  - IFC's Environmental and Social Performance Standards define IFC clients' responsibilities for managing their environmental and social risks. Climate change as a cross-cutting topic is addressed across multiple Performance Standards.
  - Environmental and Social Framework (ESF) - The ESF was launched in October 2018 and applies to all new World Bank investment project financing and enables the World Bank and Borrowers to better manage environmental and social risks of projects and to improve development outcomes.
  - The World Bank Group's climate and disaster risk screening tools - Tools provide a systematic, consistent, and transparent way of considering short- and long-term climate and disaster risks in national policies, They aim to help determine the need for further studies, consultation, and/or dialogue.

Procuring Climate-Smart PPPs

Incentives for private operators to invest in climate change adaptation and mitigation can be included in PPP request for proposals (RfPs) and other bidding documents, guidance documents on project selection and evaluation of proposals, as well as PPP policies and legislation.

Examples:

1. Minimum qualifying criteria that require potential bidders to:

- Demonstrate sufficient financial and technical capacity to develop innovative low carbon solutions and to respond to disaster events;
- Provide evidence for sufficient knowledge to identify and assess carbon impacts, low-carbon solutions as well as climate change events (e.g. experience in the construction of "green" buildings as demonstrated by relevant certifications);
- Prove sufficient insurance coverage with regard to potential climate-related risks;
- Submit appropriate environmental [and social] management plans as well as disaster prevention and risk response plans.

2. Technical specifications on better life-cycle performance, including reducing greenhouse gas emissions and mitigating identified climate change risks; and

3. Bid evaluation criteria that is not solely based on price, but that also assesses bidders' low-carbon performance and competence to address climate change (for example with additional points given to bids that include innovative efforts related to greenhouse gas reduction or disaster risk management).

Climate Resilient Infrastructure Officer Handbook: Knowledge Module on Public-Private Partnerships for Climate-Resilient Infrastructure, Global Center on Adaptation (GCA) September 2021 (Module 5 - Embedding resilience in the framework of a PPP) includes comprehensive guidance on how to build climate resilience measures into the PPP tender documents an the evaluation of bidders.

Policies and Legislation relevant for PPPs

European Union

- Directive 2014/24/EU on public procurement and Directive 2014/25/EU on procurement by entities operating in the water, energy, transport and postal services sectors - Both Directives follow the same approach: Contracts are awarded based on the economically most advantageous tender (price, cost, quality-price ratio). Contracting authority can assess costs using a life-cycle costing approach (Article 82 and Article 67 respectively). Life cycle costing may include the costs of emissions of GHG and of other pollutant emissions and other climate change mitigation costs (Article 68 and Article 83 respectively). Technical specifications may include environmental and climate performance levels (Article 42, Annex VII and Article 60, Annex VIII respectively).
- Green Public Procurement (GPP), European Commission – Voluntary instrument that was developed to facilitate the inclusion of environmental requirements in public tender documents across the EU member states. GPP criteria were developed for different project groups (e.g. road design, construction and maintenance) and are applicable for PPPs. The criteria are formulated in such a way that they can be integrated into tender documents.

Netherlands

- Rijkswaterstaat (RWS), the Department of Public Works of the Ministry of Infrastructure and the Environment uses the most economically advantageous tender (MEAT) methodology, including specific sustainability criteria for infrastructure projects and services. When assessing the sustainability RWS focuses on two criteria: CO2 emissions and environmental impact. Two instruments have therefore been developed: the CO2 performance ladder and “DuboCalc”, respectively. The CO2 performance ladder is a certification system with which a tenderer can show the measures to be taken to limit CO2 emissions within the company and in projects, as well as elsewhere in the supply chain. DuboCalc is a life-cycle analysis (LCA) based tool that calculates the sustainability value of a specific design based on the materials to be used. Bidders use DuboCalc to compare different design options for their submissions. The DuboCalc score of the preferred design is submitted with the tender price. For details see Country case: Green public procurement in the Netherlands, OECD 2016.

PPP Bidding Documents

Climate-Resilient Public Private Partnerships (Tool 3.5 Embedding Climate Resilience Into PPP Evaluation) includes sample language if RFPs want to state that various technical reports require discussion of climate resilience and how this will be evaluated.

Bulgaria

- Tender Document for the Designation of a Concessionaire and Awarding a Works Concession for Airport in Sofia of 5 July 2018 as amended on 29 March 2019 published by the Republic of Bulgaria, Ministry of Transport, Information Technology and Communications - Bidding document contains low carbon incentives: For example, bidders are required to submit an environmental and social program which shall *inter alia* include the bidder’s approach to the increase of the airport’s use and production of renewable energy and can earn extra points during evaluation in this regard.

United States

- University of Iowa – Utility Services Public-Private Partnership (PPP): The University of Iowa entered into a 50-year partnership involving its on-campus utility system with a private partner (Concessionaire). Under the lease and concession agreement (Concession), the Concessionaire will operate, maintain, optimize, and improve the utility systems for the University. The scope includes

providing heating, cooling, and electricity to the campuses through a dedicated network while also managing high-quality water, sanitary sewer and storm sewer services. Notably, the PPP will help the University of Iowa meet its zero-carbon energy transition objectives, becoming coal-free in energy production on campus by January 1, 2025, if not sooner. The RFQ of April 2019 asked *inter alia* for a description of each relevant team member's experience with the management of greenhouse gas emissions, including participation in any emission trading markets, including Renewable Energy Credits ("RECs"); natural disaster emergency management procedures as well as fuel/energy procurement and experience using alternative fuels.

PPP Case Studies

Japan

- According to Resilient Infrastructure Public-Private Partnerships (PPPs): Contracts and Procurement – The Case of Japan, World Bank 2017 - In the case of the Sendai School Meal Supply center PPP Project, Sendai City highly evaluated proposals on engineering measures to protect and minimize seismic risks as well as nonstructural measures and institutional arrangements that enabled prompt emergency response and recovery. When disaster struck, the project recovered about 2.5 months earlier than did facilities directly operated by the government, owing to the private operator's flexible selection of suppliers for emergency goods and equipment.

Netherlands

- Reconstruction Motorway A 6 Almere, Rikswaterstaat - Tender for Design, Build, Maintain and Finance Contract (DBFM) for the reconstruction of the motorway A6 Almere prepared and executed under the leadership of Rijkswaterstaat. New tendering method that aims to reduce CO2 emissions was applied and tendering parties were incentivized to offer a lean design and to apply innovative materials and working methods.
- Construction of the Sea Entrance Ijmuiden - Tender for Design, Build, Maintain and Finance Contract (DBFM) of a new lock at the sea side of the Noordzeekanaal (North Sea Channel) in the harbour of Ijmuiden to give large ocean-going vessels access to the port of Amsterdam prepared and executed under the leadership of Rijkswaterstaat. New tendering method that aims to reduce CO2 emissions was applied and tendering parties were incentivized to offer a lean design and to apply innovative materials and working methods.
- Guard lock in the river Meuse in the municipality of Limmel - Tender for design, build, maintain and finance (DBFM) prepared and executed under the leadership of Rijkswaterstaat. Contract includes the reconstruction of the guard lock and management and maintenance of the new lock, dyke structures, culvert and fixed bridge for a period of 30 years. New tendering method that aims to reduce CO2 emissions was applied and tendering parties were stimulated to offer a lean design and to apply innovative materials and working methods.

Further Guidance related to Climate-Smart Procurement

- Sustainable Procurement Platform, managed by ICLEI (Local Governments for Sustainability) - Provides up to date news, case studies, events, tools and guidance as well as links to relevant EU laws and policies and more on sustainable procurement from across the world.
- GPP 2020: Procurement for a low-carbon economy – GPP aims to mainstream low-carbon procurement across Europe in support of the EU's goals to achieve a 20 % reduction in greenhouse gas emissions, a 20 % increase in the share of RE and a 20 % increase in energy efficiency by 2020.
- Low-Carbon Innovation for Sustainable Infrastructure: The Role of Public Procurement, International Institute for Sustainable Development (IISD) and Industrial Innovation for Competitiveness 2018.

- Climate Resilience Design Guidelines (CRG), New York Port Authority (updated June 2018) – The guidelines recommend to integrate the CRG criteria early into the project delivery process and in project documents, including in (i) the project proposal; (ii) the attachment for consultant services; (iii) design criteria/performance criteria/basis of design documents; as well as (iv) the requirements and provisions for work.
- Public procurement for innovation: Good practices and strategies, OECD 2017 - The report takes stock of the strategic use of procurement for innovation in OECD Member countries and non-Member economies. It provides evidence that public procurement is a major pillar of strategic governance and service delivery. Such innovations are helping reduce energy consumption and support the transition to a low-carbon world.
- Adapting to Climate change: the role of public procurement, Greater London Authority (GLA) September 2009 - The study looks specifically at the role of public procurement with regard to climate change adaptation. It considers specifically (i) the process of embedding climate change adaptation into procurement; and (ii) the associated legal case and the economic costs and benefits. It includes case studies that describe how climate change adaptation was embedded in the procurement process, what adaptation features where incorporated in the project and the related cost, benefits and risks.

Climate-Smart PPP Contracts

There are various ways to deal with risk related to climate change and potential for carbon reduction in PPP contracts. Examples:

- Design specifications, including environmental and social safeguards that reduce greenhouse gas emissions and minimize vulnerability to climate change;
- KPIs that contain appropriate indicators, reporting obligations and inspection rights regarding climate-change mitigation and adaptation obligations;
- Contractual payment mechanisms that connect (non-)compliance with climate change mitigation and adaptation obligations with bonuses, penalties and/or payment deductions during construction and operation and maintenance (O&M) phases);
- Adjustment mechanisms within the PPP contract that allocate risks associated with unpredictable changes caused by or connected with climate change (e.g. variation mechanisms; force majeure clauses, change in law clauses etc.).

Climate Resilient Infrastructure Officer Handbook: Knowledge Module on Public-Private Partnerships for Climate-Resilient Infrastructure, Global Center on Adaptation (GCA) September 2021 (Module 5 - Embedding resilience in the framework of a PPP) includes comprehensive guidance on how to build climate resilience measures into the PPP contracts.

For an overview of how to manage climate change risks in performance- and output-based contracts see Incorporating Climate Risk in PBC Contracting Recommendations, Task 5 Report, Final Draft, World Bank Group 2018.

For an overview of how climate change considerations can be integrated into PPP contracts see also Guidance on PPP Contractual Provisions, World Bank Group 2019, *PPP Contracts in Context at subsection M (Climate Change).*

Climate-Resilient Public Private Partnerships. Includes a “high level decision framework for including climate resilience into PPP contracts”(Tool 3.2).

Design Specifications

The design features in the PPP contract can specify what kind of design will be fit to reduce greenhouse gas emissions or to respond to the anticipated occurrence of more severe and more frequent adverse weather conditions:

Australia, Victoria

- PPP Desalination Project - Project deed and ancillary documents with summaries for the design, construction and operation of a seawater desalination plant, 85 km transfer pipeline, delivery of power supply for the project, operations and maintenance, and the purchase of renewable energy credits. A key feature of the project is that all power usage during the operating phase of the project will be fully offset by power generated by renewable energy sources.
- Melbourne Metro Tunnel - Tunnel and Station PPP Project Agreement to deliver the Tunnel and Stations Public Private Partnership work package of the Metro Tunnel project. The work package consists of the main tunneling works, five underground stations, station fit-out, mechanical and electrical systems and specific maintenance services for the infrastructure delivered by the package and commercial opportunities at the new stations. The private partner must address sustainability requirements within all relevant Design Packages at each Design Stage and is required to produce a Sustainable Design Report at each stage of the design (7.18). The output specifications include climate change adaptation and mitigation requirements: The design that "must include measures for all high and extreme climate change risks to ensure the infrastructure, Stations and precincts are resilient to the projected impacts of a changing climate over the relevant asset's Design Life." This should be in accordance with the adopted climate-change projections and scenarios within the Climate Change Risk Assessment and Climate Change Adaptation Plan (15.4). Obligations with regard to the reduction of greenhouse gases are described in particular in section 15.5.

Canada, Ontario

- Milton District Hospital Redevelopment Project: Project Agreement - The project by Halton Healthcare / Infrastructure Ontario was to expand the Milton District Hospital to keep pace with the unprecedented growth of Milton, Ontario, one of the fastest growing municipalities in North America. The hospital opened to the public in the fall of 2017. Infrastructure Ontario is the provincial procurement agency in Ontario, and Halton Healthcare is a multi-site healthcare organization that operates three community hospitals, with the Milton District Hospital Expansion being their second PPP (P3) facility procured with the design-build-finance-maintain (DBFM) model. The Contract deals with the ability of the asset to withstand natural and other disasters, including climate change. The output specifications require a building to be developed that can respond to extreme weather conditions. The output specifications detail the physical requirements to accommodate the Owner's response to a large-scale disaster. For more details see Draft Output Specifications for Quality Infrastructure, Global Infrastructure Hub, 2019. Project documents, including project agreement, can be downloaded through Infrastructure Ontario.

Colombia

- The TransMilenio Bus Rapid Transit (BRT) system opened to the public in December 2000 and replaced a system of many small competing enterprises. It is considered as a model case for a mass urban transit system and was replicated by various cities. The TransMilenio operates like a rail-based system by providing dedicated lanes for the exclusive use of the system's buses, with boarding stations along the length of the lanes. It is a registered Clean Development Mechanism (CDM) project under the UN Framework Convention on Climate Change (UNFCCC). GHG emission reductions were, for example, achieved by a renewal of the bus fleet, increased capacity of the buses, improved operating conditions (e.g. bus-priority traffic signals), centralized bus-fleet control, and the introduction of pre-payment technology that which streamlined board process). Sample contracts relating to Phase I of the TransMilenio system:

- Contrato de Concesión (Concession Contract) document in Spanish with annotations in Spanish and English.
- Contrato de Operación (Operation Contract) document in Spanish with annotations in Spanish and in English

India

- Draft Concession Agreement for Public Private Partnership in Operation and Maintenance of Electric Buses in cities (OPEX Model) between the Kerala Road Fund and the Thiruvananthapuram Road Development Company Limited - The model document has been developed by the National Institute of Transforming India ("NITI") Aayog, Government of India based on international best practices, and with view of providing cleaner, more efficient and affordable public transportation. Authority awards operator the right to procure, supply, operate and maintain the buses and to construct, operate and maintain the maintenance for a period of [15] years.
- Draft Model Concession Agreement for Eco-Tourism Resort and Supporting Infrastructure – Draft document of 7 January 2019 developed by the National Institute of Transforming India ("NITI") Aayog, Government of India. Model contract contains various components related to climate change. The project infrastructure includes e.g., the construction and operation of a power facility as a renewable energy power project of at least 25000 kWh capacity. The development of the Resort shall conform with the specifications and standards as specified in the agreement, including green building standards.

Japan

- Resilient Infrastructure Public-Private Partnerships (PPPs): Contracts and Procurement – The Case of Japan, World Bank 2017 - Country report provides the wording of a contract clause related to the design requirements for safety and structural planning, as well as the establishment of an emergency system and required responses to emergency that were drafted for the Sendai Meal Supply Center (Box 4.2).

Norway, Oslo

- The Veitvet School project is being built as a PPP and consists of a new elementary and middle school for grades 1 to 10, including a multi-use hall. The private partner (Skanska) will develop, construct and maintain the school for 25 years, and has signed a contract with the Oslo municipality for leasing the school over the same period, with a possible extension. The Veivet School project follows a low carbon strategy and seeks to achieve a minimum of 50 percent reduction in greenhouse gas emissions compared to a conventional building of today´s standards. The location of Veitvet School is favourable with respect to low greenhouse gas emissions from transport (proximity to public transport). Other low carbon features are limited parking places and reserved parking for electric cars with charging points, good facilities for the use of bicycles, and a careful selection of robust materials based on associated greenhouse gas emissions.

United States, Texas

- Facility Concession Agreement between Texas Department of Transportation and the SH 130 Concession Company related to a state-owned toll road being developed under a PPP (SH 130). Construction needs to meet the requirements set forth in the Technical Requirements (7.2.1. Facility Concession Agreement). 12.3 (no. 6) of the Technical Requirements specifies, for example, the Drainage Design Criteria as follows: "all drainage structures, storm systems and outfalls shall be evaluated for the 100-year storm event".

KPIs, Monitoring and Payment

To incentivize projects that respond to the challenges of climate change appropriately, key performance indicators relating to climate change obligations (e.g. emissions, energy consumption or adaptation measures) can be built into PPP contracts together with contractual payment mechanisms that connect compliance with these obligations with bonuses, penalties and/or payment deductions.

- For an overview of how to manage climate change risks in performance- and output-based contracts see Incorporating Climate Risk in PBC Contracting Recommendations**,** Task 5 Report, Final Draft, World Bank Group 2018 - Provides an overview of how to manage climate change risks in performance- and output-based contracts. Table 5 contains standard KPIs impacted by climate change.
- Resilient Infrastructure Public-Private Partnerships (PPPs): Contracts and Procurement – The Case of Japan World Bank 2017 – The publication covers incentive mechanisms in monitoring and payment in chapter 4.3.and applies the lessons learned to climate change risks (chapter 6.3). According to the publication appropriate monitoring together with payment deductions in case of non-compliance can incentivize the private operators to meet the disaster risk related specifications set out in the proposals and performance standards.

Contractual Adjustment Mechanisms

Force Majeure

Natural disasters that cannot be controlled or reasonably prevented by a private operator are key risk factors in a PPP project. They have traditionally been treated as *force majeure* (acts of God) events with the consequence that both parties share the risk. This concept does not work in the context of climate change anymore. In particular in areas that are vulnerable to the consequences of climate change where natural disasters have become more frequent and more probable events during the term of the contract the parties need to consider climate change issues from an early stage and assess how such risks could be addressed and mitigated throughout the entire project cycle. While risks that can be planned for may not qualify as *force majeure* anymore exceptional climate change events would still qualify.

Therefore, defining *force majeure* and contractually allocating the disaster risks between the public and private entities in a way that it is commercially acceptable for private operators and investors are essential for structuring resilient infrastructure projects.

Examples of different force *majeure provisions*:

- Resilient Infrastructure Public-Private Partnerships (PPPs): Contracts and Procurement – The Case of Japan - Table 6.1 presents sample provisions that can be included in contracts that take account of climate change risk.
- Guidance on PPP Contractual Provisions, World Bank Group 2019 contains sample drafting for *force majeure* provisions (sections 1.4 and 1.5).
- Emerging Trends in Mainstreaming Climate Resilience in Large Scale, Multi-sector Infrastructure PPPs, PPIAF 2016.
- Force Majeure – Checklist and Sample Wording

The following solutions are discussed in literature:

- According to the Guidance on PPP Contractual Provisions, World Bank Group 2019, 1.4 Sample Drafting and section 1.2.1.5 *"(…) the impact of climate change and the treatment of climate risk events is coming under increasing scrutiny in PPP Projects. (…) [With regard to climate change] the parties may (for example) want to specify certain types of extreme weather conditions or changes in habitat which qualify as Force Majeure events in order to address climate change risks as they relate to their specific project (for example, sea levels rising beyond a certain level where this would adversely affect*

a project located on the coast). This approach recognizes that, while the impacts of climate change may have become increasingly foreseeable, it is unlikely to be in the affected Party's power to prevent, avoid or overcome certain events on its own. (…) the Parties should carefully assess whether the legal system in the country, in which their PPP Project is located, allows for inclusion of such events under Force Majeure." See also the section entitled PPP Contracts in Context at subsection M (Climate Change).

- Climate-Resilient Public Private Partnerships, IDB 2020 – The toolkit suggests to apply a nuanced approach and to treat climate risk events that cannot be foreseen and managed by the developer as well as regularly occurring climate risk events that are exceptional, e.g. because of their intensity, as force majeure (checklist for *force majeure* definition - tool 4.2). A similar approach is described in Climate Resilient Infrastructure Officer Handbook: Knowledge Module on Public-Private Partnerships for Climate-Resilient Infrastructure, Global Center on Adaptation (GCA) September 2021 (Module 5 - Embedding resilience in the framework of a PPP)
- Impacts of climate change – foreseeable or unforeseeable? Drafting force majeure clauses in the era of climate uncertainty, McCarthy Tetrault, August 2018 – The article outlines the potential role of the *force majeure* clause in the context of climate change, and summarizes key considerations and effective drafting techniques. It recommends instead of using boilerplate language to draft *force majeure* clauses carefully and discusses specific elements that should be considered during the negotiation. While the article is based on the International Chamber of Commerce (ICC) *force majeure* provision, the general considerations are equally relevant for PPP projects.
- Resilient Infrastructure Public-Private Partnerships (PPPs): Contracts and Procurement – The Case of Japan - The case study covers specifically how disaster risks are typically dealt with in PPP contracts, in particular force majeure risks (chapter 3) and applies the lessons learned to climate change risks (chapter 6.2).
- Force Majeure and Climate Change What is the New Normal? Jocelyn L. Knoll and Shannon L. Bjorklund*, Journal of the American College of Construction Lawyers, 2014'. This Article focuses on construction contracts in the United States and describes how parties and courts approach *force majeure* questions in various contexts, including how both currently distinguish expected but severe weather (not generally a *force majeure* event) from unexpectedly or unusually severe weather (potentially a *force majeure* event). It then examines how these methods will need to evolve in light of changing weather patterns.

Uninsurability

The availability of insurance plays an important part in assessing how the risk of natural disaster and climate risk events should be allocated under the PPP Contract. Where there is a risk that a required insurance may become unavailable during the term of the contract this may be addressed through bespoke contractual provisions.

See also Guidance on PPP Contractual Provisions, World Bank Group 2019 (section 1.3).

Change in Law

Another question regards the risk allocation in the event of a change of legislative requirements to address the impact of climate change, e.g. the requirements under a Building Code are changed or a carbon price is introduced.

There are several approaches to allocate change in law risk (for details see section 3 of the Guidance on PPP Contractual Provisions, World Bank Group 2019). In general, the private partner may be able to claim relief if the change in law to respond to climate change was not yet foreseeable when the pricing decision was made, e.g. when the bid was submitted (or when the contract was signed).

Climate Change Risk & Insurance

Mandatory insurance requirements in PPP legislation or contracts may cover risk related to climate change to some extent. With more frequent occurrence of climate change events it may, however, become increasingly hard or costly to obtain insurance for certain disaster events caused by climate change in specific regions. On the other hand, some insurers could be willing to offer lower insurance premiums for companies that undertake actions that reduce climate risks.

According to the Guidance on PPP Contractual Provisions, World Bank Group 2019, section 1.2.1.5 "*(…) Some events (or degrees of event) may be insurable and, (…) it may be appropriate for the Contracting Authority to require the Private Partner to insure against these risks and/or to exclude them from the full scope of the Force Majeure provisions (or to set certain thresholds before they qualify as Force Majeure events). The Contracting Authority should bear in mind that the occurrence of certain climate risk events over the life of the PPP Contract may affect insurance premiums and availability (and in some insurance markets may not have capacity to cover such risks in the first place). This insurance risk should form part of any assessment as to how to treat climate risks in the PPP Contract. (…)*".

Resilient Infrastructure Public-private Partnerships (PPPs): Contract and Procurement – The Case of India, World Bank, 2018 gives an overview on the availability of insurance for PPP projects in the context of climate change in India.

Resilient Infrastructure Public-Private Partnerships (PPPs): Contracts and Procurement – The Case of Japan, World Bank 2017 - Chapter 5, “Insurance and Financial Institutions,” reviews the roles and benefits of insurance in the context of disaster risk and climate change with regard to infrastructure PPPs.

Related Content

- **Climate-Smart PPPs**
- **Climate-Smart PPP Legal and Regulatory Framework**
- **?Sector-Specific Content on Climate-Smart**
- **Renewable Energy**
- **Climate-Smart PPPs: Further Reading and Resources**

Additional Resources

- Sub-national and Municipal PPPs
- Public-Private Partnerships for Transport
- Power and Renewable Energy PPPs

Partner Resources



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