

International Arbitration in Latin America
Energy and Natural Resources Disputes

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CHAPTER 18

Achieving Latin America's Energy Transition: Looking into the Roles of International Arbitration and Dispute Avoidance

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On the basis that 'climate change is a reality', this chapter focuses on disputes that may arise in relation to energy transition in Latin America. It addresses the tools, techniques, and mechanisms to avoid and handle disputes before they escalate to a dispute board, expert, mediator, arbitration, or court.

This chapter identifies these disputes and groups them into four categories, based on the subject matters in dispute: (1) those related to investments required to make the world more sustainable; (2) those related to adaptation and mitigation measures; (3) those related to new voluntary social responsibility standards applicable to funders, investors, insurance companies and credit rating agencies; and (4) those arising due to changes in circumstances. Focusing on the subject matter in dispute helps understand the type of disputes and anticipate better how to address these areas of risk when developing a project.

[A] INTRODUCTION

There is a wide variety of climate change-related disputes; examples include constitutional law, human rights, administrative law, contractual or tort claims, as well as claims related to permitting and planning, finance and corporate law. While claims raising public law issues present challenging legal aspects, such as application of the public trust doctrine, justiciability, defining sources of climate obligations, causation and remedies available, most claims arising from commercial transactions can be classified within traditional legal categories and general dispute prevention and

resolution tools are applicable.¹ Academic discussion and the coverage on the media are mainly dominated by disputes with public law issues, but ICC Report entitled 'Resolving Climate Change Related Disputes Through Arbitration and ADR' (ICC Report) has focused on commercial disputes.²

ICC Report takes a broad view of climate change-related disputes, including any dispute arising from or related to the effect of climate change and climate change policy, the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement.³

ICC Report classifies these disputes into three categories, according to the underlying contracts that give rise to the disputes: (1) contracts relating to the implementation of energy or other systems transition,⁴ mitigation⁵ or adaptation;⁶ (2) contracts without any specific climate-related purpose or subject matter where a

1. For an overview on climate change disputes *see*, for example, United Nations Environment Programme, *UN Report on the Status of Climate Change Litigation, A Global Review* 2017, <https://wedocs.unep.org/bitstream/handle/20.500.11822/20767/climate-change-litigation.pdf?sequence=1&isAllowed=y> (accessed 31 Jul. 2020); International Chamber of Commerce (ICC), *Resolving Climate Change Related Disputes Through Arbitration and ADR* 2019, <https://iccwbo.org/publication/icc-arbitration-and-adr-commission-report-on-resolving-climate-change-related-disputes-through-arbitration-and-adr/> (accessed 31 Jul. 2020); or International Bar Association (IBA), *Achieving Justice and Human Rights in an Era of Climate Disruption*, <https://www.ibanet.org/PresidentialTaskForceClimateChangeJustice2014Report.aspx> (accessed 31 Jul. 2020).
2. ICC Report indicates that it '... is focused primarily on commercial contract disputes, which represent the vast majority of cases administered by the ICC Court. However, climate change related disputes may also arise pursuant to investor-State treaties, including but not limited to claims arising out of new climate change related regulatory measures implemented by a State. A number of investment treaties provide for ICC Arbitration, and the ICC Court administers investment treaty cases. Therefore, this category of disputes is taken into account by the Task Force, and certain mechanisms or features considered in this Report would apply in equal measure to climate change related disputes arising out of treaty claims', ICC, *Resolving Climate Change Related Disputes Through Arbitration and ADR* 2019, 12, <https://iccwbo.org/publication/icc-arbitration-and-adr-commission-report-on-resolving-climate-change-related-disputes-through-arbitration-and-adr/> (accessed 31 Jul. 2020). Several authors point out the flexibility of arbitration as a suitable forum for non-commercial disputes. *See*, for example, David W. Rivkin and Catherine Amirfar, *Climate Disputes and Sustainable Development in the Energy Sector: Future Directives*, in *International Arbitration in the Energy Sector* (Maxi Scherer, Oxford University Press, 2018) and Wendy Miles and Nicola Swan, *Climate Change and Dispute Resolution*, 11 *Dispute Resolution International* 2, 117-132 (2017).
3. *See also* in this book Chapter 19, Daniela Páez-Salgado and Emily Westphalen, *Climate Change and International Arbitration in Latin America* and ICC Report, *supra* n. 2, at 8.
4. The 2018 Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5°C (IPCC Special Report) defines 'transition' as 'the process of changing from one state or condition to another in a given period of time. Transition can be in individuals, firms, cities, regions and nations, and can be based on incremental or transformative change'. IPCC, *Special Report on Global Warming of 1.5°C*, 559, <https://www.ipcc.ch/sr15/> (accessed 31 Jul. 2020). The transition to sustainable energy, land, urban and infrastructure and industrial systems is called 'systems transition', a concept coined by IPCC Special Report.
5. IPCC Special Report defines 'mitigation' of climate change as 'a human intervention to reduce emissions or enhance the sinks of greenhouse gases. Note that this encompasses carbon dioxide removal (CDR) options'. It also defines 'mitigation measures', saying that 'in climate policy, mitigation measures are technologies, processes or practices that contribute to mitigation, for example renewable energy (RE) technologies, waste minimization processes, public transport commuting practices'. *See* IPCC Special Report, *supra* n. 4, at 554.
6. IPCC Special Report defines 'adaptation of human systems' as 'the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities.

dispute involves or gives rise to a climate issue or climate-related environmental issue; and (3) submissions or other specific agreements to resolve existing climate change or climate-related environmental disputes, potentially involving impacted groups or populations.⁷ This classification is key because disputes referred to arbitration need to be arbitrable in nature and a valid and binding arbitration agreement is required. From a different angle, as explained later, it is also useful to classify these disputes according to subject matter.

ICC Report focuses on arbitration and Alternative Dispute Resolution (ADR) tools, techniques and mechanisms available for such disputes, as well as on identifying key considerations to bear in mind and areas where capacity needs to be built and regulations implemented.⁸ In this chapter, the central focus will be on tools, techniques, and mechanisms to avoid and handle disputes before they escalate to a dispute board, expert, mediator, arbitration, or court. To provide a concrete framework for discussion, this chapter focuses on disputes that may arise in relation to energy transition in Latin America.

[B] THE ENERGY TRANSITION

Climate change is a reality⁹ which will require rapid and far-reaching transition regarding energy, land, cities and infrastructure (including transport and buildings) and industrial systems, in order to mitigate the most serious effects.¹⁰ Energy transition means the process of replacing the existing energy systems, i.e., power generation, heating, and transportation, for carbon-neutral systems. This transition will imply divestments, investments and several shifts in the way the economy and the society works. For example, fostering a more 'circular' energy system, with energy efficiency

In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects'. See IPCC Special Report, *supra* n. 4, at 542.

7. See ICC Report, *supra* n. 2, at 8.

8. ICC Report 'identifies six broad features that potentially enhance the existing procedures to further improve their effectiveness for resolving climate change related disputes (section V). These features, which parties to a climate change related dispute (together with arbitral tribunals as the case may be) may wish to take into account, where appropriate and on a case-by-case basis, include: A. Securing relevant expertise, scientific, technical or otherwise, to ensure that decisions reflect sound and up-to-date knowledge in a new and fast-moving area. B. Highlighting opportunities to use faster and more effective procedures commensurate with the complexity, urgency and special sensitivities of a collaborative climate change response. C. Exploring the opportunity for integration of climate change policy, commitments or law into the dispute resolution procedure. D. Weighing the possible benefits of some increased measure of transparency. E. Considering options for third party involvement in the dispute resolution procedure. F. Addressing the role of costs in ensuring that appropriate stakeholders are able to participate in the dispute resolution process'. See ICC Report, *supra* n. 2, at 7.

9. There is abundant scientific evidence showing that it is beyond reasonable doubt that the Earth's climate is warming. See IPCC Special Report, *supra* n. 4, at 56-64.

10. See IPCC Special Report, *supra* n. 4, at 15.

at its core, a greater direct electrification of end-use sectors and using clean fuels for those sectors where electrification is difficult.¹¹

Nevertheless, public and private action is not being taken at the required pace.¹² Sustainability is gaining central relevance in business activities. Internal and external stakeholders are demanding projects and activities that contribute to environmentally and socially harmonious progress.

Investors are increasingly willing to become involved in activities that do not pollute, respect human rights and generally comply with social responsibility.¹³ Several

11. These areas of action are part of the six pillars of EU Strategy for Energy System Integration. European Commission, *Powering a Climate-Neutral Economy: An EU Strategy for Energy System Integration*, 4-20, https://ec.europa.eu/energy/sites/ener/files/energy_system_integration_strategy.pdf (accessed 10 Jul. 2020).
12. The Brown to Green Report 2019 shows that none of the G20 countries is on track to meet the Paris Agreement target. Climate Transparency, *The Brown to Green Report*, <https://www.climate-transparency.org/g20-climate-performance/g20report2019> (accessed 31 Jul. 2020). In relation to Latin America, the Interamerican Development Bank (IDB) indicates that: 'NDCs fail to put the region on a low emission and economically prudent pathway to achieve the objectives of the Paris Agreement.' IDB and Deep Decarbonization Pathways for Latin America and the Caribbean, *Getting to Net-Zero Emissions: Lessons from Latin American and the Caribbean*, <https://publications.iadb.org/en/getting-net-zero-emissions-lessons-latin-america-and-caribbean> (accessed 31 Jul. 2020). In the words of the International Energy Agency (IEA): 'Current country commitments, the Nationally Determined Contributions (NDCs), made under the Paris Agreement and domestic energy policy plans fail to bring about the rapid, far-reaching changes required to avert dangerous and irreversible changes in the global climate system. These are assessed in our Stated Policies Scenario and lead to total global energy-related CO₂ emissions growing steadily from today's levels before plateauing around 36 Gt after the mid-2040s. This trajectory is consistent with limiting the temperature increase to below 2.7 °C above pre-industrial averages with a 50% probability (or below 3.2°C with 66% probability).' IEA, *World Energy Outlook 2019*, 96.
13. The Paris Agreement contemplates that governments shall make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development; this is marking the path in this direction. Article 2.1 of the Paris Agreement states: '1. This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by: (a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change; (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and (c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.' For example, in 2017, the Task Force on Climate-Related Financial Disclosures of the G20 Financial Stability Board issued a series of recommendations to address gaps in the information disclosed on the financial impact of climate risk across the investment chain. The recommendations and related data are available at <https://www.fsb-tcfd.org/> (accessed 31 Jul. 2020). Regarding insurance companies' investment policies see: Maryam Golnaraghi, *Climate Change and the Insurance Industry: Taking Action as Risk Managers and Investors*, <https://www.genevaassociation.org/research-topics/extreme-events-and-climate-risk/climate-change-and-insurance-industry-taking-action> (accessed 31 Jul. 2020). A tracker of progressive climate actions and climate commitments of financial institutions, investment funds and rating agencies is available at <https://unclimatesummit.org/trackerhome/trackerfinance/> (accessed 31 Jul. 2020). See also: Paul A. Griffin and Amy Myers Jaffe, *Are Fossil Fuel Firms Informing Investors Well Enough about the Risks of Climate Change?*, 36 *Journal of Energy & Natural Resources* 4, 381-410 (2018); Damilola S. Olawuyi, *Climate Justice and Corporate Responsibility: Taking Human Rights Seriously in Climate Actions and Projects*, 34 *Journal of*

voluntary initiatives confirm this, such as the principles of the Task Force on Climate-Related Financial Disclosures or the European Union Green New Deal.¹⁴ Financial institutions,¹⁵ insurance companies and credit rating agencies¹⁶ are on the same path. Employees want to work for companies of which they can feel proud.¹⁷ Many politicians are also following suit, either out of conviction or because it is expected or politically correct.

These expectations and internal purposes are defining corporate conduct and several voluntary initiatives are being pursued.¹⁸ Decarbonization derives from the government's greenhouse gas (GHG) emissions targets, followed by voluntary GHG emissions targets established by some corporations as a result of their social responsibility policies and commitments. Some clean-power targets go as far as aiming to reduce GHG by 100%.¹⁹

The Covid-19 pandemic is not inherently climate-friendly.²⁰ Some countries might take the opportunity to implement carbon taxes²¹ or foster greener industry.

Energy & Natural Resources Law 1, 27-44 (2016); Forum Pour L'Investissement Responsable, *Article 173-VI: Understanding the French Regulation on Investor Climate Reporting*, https://www.frenchsif.org/isr-esg/wp-content/uploads/Understanding_article173-French_SIF_Handbook.pdf (accessed 31 Jul. 2020); *United Nations Principles for Responsible Investment*, <https://www.unpri.org/pri> (accessed 31 Jul. 2020). Regarding the discussion about whether the world's capital markets carry a carbon bubble see <https://carbontracker.org/terms/carbon-bubble/> (accessed 31 Jul. 2020).

14. European Commission, *The European Green Deal* 2019, https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf (accessed 31 Jul. 2020).
15. Most large banks have committed to disclosing their climate change-related risk exposures but, as Moody's reported in March 2020, comprehensive standardized reporting of risks, opportunities and estimated financial impacts is a long way off. Its assessment is that only 32% of large banks even partially disclose how climate risk would affect their financial performance under global warming stress scenarios. Thus, this reporting and scrutiny are likely to increase. See: https://www.moody's.com/research/Moodys-Big-banks-climate-risk-disclosures-have-room-for-improvement-PBC_1217341 (accessed 31 Jul. 2020).
16. See, for example, Maryam Golnaraghi, *Climate Change and the Insurance Industry*, *supra* n. 13; Chris D'Angelo, *First Major U.S. Insurance Company Moves Away from Coal*, <https://grist.org/article/first-major-u-s-insurance-company-moves-away-from-coal/> (accessed 31 Jul. 2020).
17. See, for example, Yale Climate Opinion Maps available at: <https://climatecommunication.yale.edu/visualizations-data/ycom-us/> (accessed 31 Jul. 2020) or the Orsted Green Energy Barometer available at: <https://orsted.com/en/barometer> (accessed 31 Jul. 2020).
18. A tracker of several of the progressive climate actions and climate commitments of corporations is available at: <https://unclimatesummit.org/trackerhome/trackerbusiness/> (accessed 31 Jul. 2020).
19. The G20 country-level pledges, Nationally Determined Contributions (NDCs) and net-zero commitments are available at: <https://unclimatesummit.org/trackerhome/trackercountries/> (accessed 31 Jul. 2020). Regarding the United Nation's Net-Zero Asset Owner Alliance see: <https://www.unepfi.org/net-zero-alliance/> (accessed 31 Jul. 2020).
20. See, for example, International Renewable Energy Agency (IRENA), *Global Renewables Outlook 2020*, <https://www.irena.org/publications/2020/Apr/Global-Renewables-Outlook-2020> (accessed 31 Jul. 2020); The Economist, *The Other Crisis. Can Covid Help Flatten the Climate Curve?*, digital edition 21 May (2020); The Economist, *Never Let a Crisis Go to Waste. The Pressure to Make the Post-Covid Rebound Green*, digital edition 21 May (2020).
21. The Economist, *Fighting Climate Change. The World Urgently Needs to Expand Its Use of Carbon Prices*, digital edition 21 May (2020); Don C. Smith, *A Carbon Tax in America's Future? Leading Republicans Propose the Idea*, 35 *Journal of Energy & Natural Resources Law* 2, 103-107 (2017).

Nevertheless, in other countries there is a risk of adopting climate-damaging policies by granting privilege to economic recovery.²²

[1] The Latin American Perspective

There is a key difference between high-income countries and middle- and low-income countries.²³ High-income countries are industrialized with extensive access to electricity, resulting in the difficult challenge of decarbonizing their economy. However, as low- and middle-income countries are not industrialized or electrified, their challenge lies in expanding energy access and industrializing. There are about 840 million people without electricity in the world and three billion people lack clean cooking fuels and technology.²⁴

In terms of industrialization, Latin America's manufacturing value-added share in Gross Domestic Product (GDP) is 13%.²⁵ In many ways, economic development is related to an increase in energy demand. Requiring lower-income countries to grow only in a sustainable way, or incur significant investment for transition, imposes additional pressure to their already limited resources and capabilities, thus creating debate regarding how to implement these necessary restrictions thinking on long-term sustainable growth.²⁶ Latin America²⁷ is home to 8.3% of the world's population and accounts for almost 6% of global energy demand. Most countries in the region are considered upper-middle-income economies, but Chile, Panama, Puerto Rico and

22. The Economist, *A New Opportunity to Tackle Climate Change. Countries Should Seize the Moment to Flatten the Climate Curve*, digital edition 21 May (2020); The Economist, *Brown Elephants. A Glut of New Coal-Fired Power Stations Endangers China's Green Ambitions*, digital edition 21 May (2020).

23. The World Bank classifies the world's economies into four income groups – high, upper-middle, lower-middle, and low. This assignment is based on Gross National Income (GNI) per capita. See: <https://datahelpdesk.worldbank.org/knowledgebase/articles/378834-how-does-the-world-bank-classify-countries> (accessed 31 Jul. 2020).

24. United Nations (UN), *The Sustainable Development Goals Report 2019*, 36, <https://unstats.un.org/sdgs/report/2019/The-Sustainable-Development-Goals-Report-2019.pdf> (accessed 31 Jul. 2020); see also: IEA, *World Energy Outlook*, 23, (2019).

25. UN, *The Sustainable Development Goals Report*, *supra* n. 24, at 40.

26. See, for example, Inevitable Policy Response, *Why a Just Transition Is Crucial for Effective Climate Action*, <https://www.unpri.org/download?ac=7092> (accessed 31 Jul. 2020); UNFCCC, *Just Transition of the Workforce, and the Creation of Decent Work and Quality Jobs*, <https://unfccc.int/sites/default/files/resource/Just%20transition.pdf> (accessed 31 Jul. 2020); Milton Montoya and others, *Meanings of Energy Poverty in the South American Context: A Regional Overview*, in *Energy Justice and Energy Law*, 217-237 (Oxford University Press, Kindle edition, 2020); Miguel Marmolejo-Cervantes, *Energy Justice as a Key Driver to Unlock the Transition from Energy Reform to Energy Counter-Reform: The Rise of the Immutability Theory*, in *Routledge Handbook of Energy Law*, 310-323 (Taylor and Francis, Kindle edition, 2020); Lisa Viscidi and Nate Graham, *Low-Carbon Energy in Latin America: Post-Paris Advances in Renewable and Energy Efficiency Policies*, in *Routledge Handbook of Energy Law*, 324-341 (Taylor and Francis, Kindle edition, 2020); or Raya Salter and others (Eds.), *Energy Justice: US and International Perspectives* (Elgar, 2018).

27. References to Latin America in this chapter generally include the Caribbean.

Uruguay are high-income and Bolivia, El Salvador, Nicaragua are low-middle income.²⁸ Nevertheless, 76.8% of Latin America's population belongs to the low-income or lower-middle-income strata.²⁹

Significant social and economic development-level disparity can be seen in per capita energy demand. For example, Chile, Argentina and Venezuela have four times the per capita energy requirements of Honduras, Nicaragua or Haiti. This diversity is reflected in Energy Transition Index (ETI) rankings,³⁰ where the region's countries are scattered between 11th and 115th place.³¹ The region is responsible for approximately 8% of the world's total carbon dioxide emissions.³²

Most countries in this group have low levels of pollution, emissions per capita and carbon intensity due to the high proportion of renewables and low proportions of oil, gas and coal within its energy mix. The impact of renewable energy production on environmental scoring is even clearer for Uruguay, Costa Rica and Brazil, which are among the ten highest-scoring countries in ETI's environmental sustainability rankings, with large shares of renewables in their total primary energy supply.³³

Hydropower is the primary renewable source of electricity for many of the region's countries, meeting 60% of the region's electricity demand.³⁴ This increases the electricity system's vulnerability to water availability. Climate change creates a risk of unexpected, prolonged droughts and reduces glaciers. The impacts of climate change affect water availability, food production and quality and the incidence of vector-borne diseases. IPCC³⁵ observes many changes in the region's climate, including significant variations in temperature and rainfall. The Andean glaciers are retreating, affecting

28. See: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups> (accessed 31 Jul. 2020).

29. Economic Commission for Latin America and the Caribbean (ECLAC), *Social Panorama of Latin America*, p. 55, <https://www.cepal.org/en/publications/44989-social-panorama-latin-america-2019> (accessed 31 Jul. 2020).

30. ETI is crafted by the World Economic Forum Fostering Effective Energy Transition initiative and it is available at: <https://www.weforum.org/reports/fostering-effective-energy-transition-2020> (accessed 31 Jul. 2020). Also see: World Economic Forum (WEF), *Fostering Effective Energy Transition*, http://www3.weforum.org/docs/WEF_Fostering_Effective_Energy_Transition_2019.pdf (accessed 31 Jul. 2020).

31. WEF, *Fostering Effective Energy Transition*, *ibid.*, 21.

32. This percentage considers emissions in 2014. See: IDB and Deep Decarbonization Pathways for Latin America and the Caribbean, *Getting to Net-Zero Emissions: Lessons from Latin American and the Caribbean*, *supra* n. 12, at 36. See also: Alicia Bárcena and others, *The Climate Emergency in Latin America and the Caribbean: The Path Ahead – Resignation or Action?*, <https://www.cepal.org/en/publications/45678-climate-emergency-latin-america-and-caribbean-path-ahead-resignation-or-action> (accessed 31 Jul. 2020).

33. IDB and Deep Decarbonization Pathways for Latin America and the Caribbean, 'Getting to Net-Zero Emissions: Lessons from Latin American and the Caribbean', *supra* n. 12, at 36.

34. See: Corporación Andina de Fomento (CAF), *Vulnerability Index to Climate Change in the Latin American and Caribbean Region*, <http://scioteca.caf.com/handle/123456789/509> (accessed 31 Jul. 2020); Alicia Bárcena and others, *Economics of Climate Change in Latin America and the Caribbean*, https://repositorio.cepal.org/bitstream/handle/11362/43889/1/S1800475_en.pdf (accessed 31 Jul. 2020).

35. Climate & Development Knowledge Network, *The IPCC's Fifth Assessment Report. What's in it for Latin America?*, <https://cdkn.org/wp-content/uploads/2014/11/IPCC-AR5-Whats-in-it-for-Latin-America.pdf> (accessed 31 Jul. 2020).

seasonal distribution of stream flows. Latin America has abundant freshwater resources, but they are unevenly distributed. Existing resources are very important for urban water supply, hydropower and the agriculture practised by the hundreds of millions of people in the region. Brazil has one of the lowest carbon-intensive energy systems, but its carbon emissions per unit of power production nearly doubled between 2006 and 2015. This was caused by the development of backup power sources to maintain high levels of water storage in dams and overcome the risk of prolonged drought conditions. Energy access has increased from 91.7% in 2000 to 97.7% in 2016.³⁶ Low- and middle-income countries are more exposed to climate change risk as they have fewer economic resources, infrastructure, and capabilities. According to IDB, the region is the world's most biodiverse region and one of the most vulnerable to climate change impact.³⁷

[2] Two Key Drivers for Energy Transition: Efficiency and Decarbonization

As Michael Weber says, energy brings illumination, information, heat, clean water, abundant food, motion, comfort and much more to our homes and factories at the turn of a valve or the touch of a button. It has the potential to harvest a crop, refrigerate it, and fly around the world, as well as guaranteeing education, health and security. Our civilization is based on access to energy and therefore lack of energy would lead to its collapse.³⁸ Although the path towards zero-carbon energy is electrifying as many activities as possible, the fastest, cheapest and most reliable way to reach that goal probably includes a mixture of low-carbon electricity and low-carbon gases.³⁹ A recent study shows that this mixture would achieve greater decarbonization by 2050, allowing more flexibility and resilience as well as being less expensive.⁴⁰

A clear distinction must be made between electricity generation and the energy system as a whole. For example, in a country like Belgium, electricity is estimated to account for 16.6% of final energy consumption. If we consider all of Europe, this figure rises to 17.9%.⁴¹ Electricity is the most efficient form of energy, because its capacity for physical work (exergy) is the highest, at 100%. However, it can be difficult to replace some energy sources with electricity. Thus, various energy sources, such as green⁴²

36. WEF, *Fostering Effective Energy Transition*, *supra* n. 30, at 21.

37. IDB and Deep De-carbonization Pathways for Latin America and the Caribbean, *Getting to Net-Zero Emissions: Lessons from Latin American and the Caribbean*, *supra* n. 12, at 4.

38. Michael E. Webber, *Research Is Necessary to Accelerate Our Transition to a Zero-Carbon World*, 4 *Pour La Science* (April 2020); Michael E. Webber, *Power Trip: The Story of Energy*, 1-12 (Basic Books, Kindle edition, 2019).

39. Michael E. Webber, *Research Is Necessary to Accelerate Our Transition to a Zero-Carbon World*, *supra* n. 38, at 5.

40. Hugues De Peufelhoux and others, *Optimising Carbon Reductions*, 11 *Pour La Science*, 11 (April 2020).

41. Ronnie Belmans and Jan Mertens, *The Molecules of the Energy Transition*, 6 *Pour La Science* (April 2020).

42. Hydrogen is generally produced in ways that emit CO₂. Nevertheless, when it is produced using water electrolysis with electricity sourced from renewable power plants, such as wind or solar,

hydrogen, methane, ethane and ethanol, among others, can be used to complement or replace electricity.⁴³

Energy consumption will grow steadily until 2050, and may even have doubled by that date.⁴⁴ This is mainly due to six factors: (1) population growth, (2) economic growth, (3) urbanization, (4) industrialization, (5) electrification and (6) motorization.⁴⁵ It is estimated that, in order to reach the Paris Agreement target, an annual average of investment of USD 3.2 trillion would be needed until 2040.⁴⁶ This investment is mainly based on increasing demand for power, energy transition promoting low-carbon electricity and the need to replace ageing electricity assets in many countries.

[i] Efficiency

Technology, knowledge, interconnectivity, and data are increasing efficiency in every activity. Energy efficiency technology and cost reductions are independent from decarbonization. It is key, by itself, to reducing GHG emissions,⁴⁷ but would have happened anyway because it is technology driven. Food production, manufacturing, transport (including vehicles, trains and trucks that use electricity, hydrogen, or other energy sources), heating and many other areas increasingly require fewer resources and likewise less energy.

This is creating distributed solutions in several activities, such as teleworking, offsite construction and 3D printing manufacturing. In the electricity sector, it is creating distributed generation solutions which generate electricity on a small scale for domestic or local use, as well as allowing for development of smart cities, smart grids, smart homes and so on. This is a game changer in the power sector because power generation has been developed based on large, centralized generating facilities, with long transmission lines and distribution networks to reach consumers.

or nuclear power plants, it is called 'green' hydrogen, and that is the type of hydrogen that is generally being considered as useful for the energy transition. See, for example, IRENA, *Hydrogen from Renewable Power: Technology Outlook for the Energy Transition*, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Sep/IRENA_Hydrogen_from_renewable_power_2018.pdf (accessed 31 Jul. 2020).

43. Ronnie Belmans and Jan Mertens, *The Molecules of the Energy Transition*, *supra* n. 41. Renewable hydrogen in particular, is gaining momentum, as it 'can be used as a feedstock, a fuel or an energy carrier and storage, and has many possible applications across industry, transport, power and buildings sectors. Most importantly, it emits no CO₂ and almost no air pollution when used. It thus offers a solution to decarbonise industrial processes and economic sectors where reducing carbon emissions is both urgent and hard to achieve'. European Commission, *A hydrogen strategy for a climate-neutral Europe*, https://ec.europa.eu/energy/sites/ener/files/hydrogen_strategy.pdf (accessed 31 Jul. 2020).

44. McKinsey, *Global Energy Perspective 2019: Reference Case*, 5, <https://www.mckinsey.com/industries/oil-and-gas/our-insights/global-energy-perspective-2019> (accessed 31 Jul. 2020).

45. These trends are explained by Michael Webber in his book *Power Trip: The Story of Energy*, see *supra* n. 38.

46. IEA, *World Energy Outlook 2019*, *supra* n. 12, at 51.

47. IRENA, *Global Renewables Outlook*, *supra* n. 20, at 164-166.

Cost reduction and increased efficiency of wind and solar power generation are changing the feasibility of these technologies.⁴⁸ Reduced costs and increased efficiency of electricity storage solutions are supporting these developments, as they enable detachment from the grid and deal with intermittent power generation typical of renewables such as solar and wind power.⁴⁹ Other power storage technologies are also developing, such as ‘power-to-gas’ (storing energy from electricity by transforming it into gas, such as hydrogen) and ‘power to gas to power’.⁵⁰ For example, there is a growing expectation regarding the role of ‘green’ hydrogen. In the case of Latin America, *green* hydrogen could be the key to developing electricity grids in remote areas. South America’s geography is marked by the Andes and the Amazon Rainforest and Central America and Mexico’s by many mountain ranges and dense forests, including Sierra Madre Occidental, Oriental and the Trans-Mexican Volcanic Belt, increasing the challenge of inhabiting large areas. Cost reduction and increased efficiency of energy solutions, many of which imply using green hydrogen, could enhance land use in an environmentally friendly manner, as well as help achieving a competitive energy sources mix for transition.⁵¹

[ii] Decarbonization

To meet the Paris Agreement targets, energy-related carbon dioxide emissions need to be reduced by a minimum of 3.8% per year from 2020 until 2050, with continued reductions thereafter.⁵² Climate change is one of the megatrends shaping the future of infrastructure; a large-scale, transformative, well-established trend developing exponentially. It has the potential to fundamentally change users’ needs, shift where value is created and reshape the nature of competition.⁵³ Some reduction in *GHG* emissions may be undertaken relatively quickly by decommissioning coal-fired power plants and replacing them with facilities which emit less. Nevertheless, in the short to medium term, either for technical, political or economic reasons, it is difficult to de-commission gas-fired power plants and other activities which require burning fuels, such as heavy long-distance freight trucks, marine ships and airplane, or stoves and heating.⁵⁴ Part of

48. *Ibid.*, 60-61.

49. IEA, *World Energy Outlook 2019*, *supra* n. 12, at 293-294.

50. See, for example, Adeline Duterque, Luc Goossens and Jan Mertens, *The ‘and’ of the Energy Transition*, 33 *Pour La Science*, (April 2020); Hydrogen Council, *Path to Hydrogen Competitiveness*, https://hydrogencouncil.com/wp-content/uploads/2020/01/Path-to-Hydrogen-Competitiveness_Full-Study-1.pdf (accessed 31 Jul. 2020); or McKinsey, *Redefining the Power Industry*, 7, <https://www.mckinsey.com/business-functions/sustainability/our-insights/redefining-the-power-industry> (accessed 31 Jul. 2020).

51. There is an increasing interest in ‘green’ hydrogen in Latin America. For the moment, probably Chile is the country that has been discussing more about this energy source and is developing a Green Hydrogen National Strategy. See, for example, <https://www.energia.gob.cl/mini-sitio/hidrogeno-verde> (accessed 31 Jul. 2020).

52. IRENA, *Global Renewables Outlook*, *supra* n. 20, at 64.

53. Global Infrastructure Forum (GIF), *Infrastructure Futures: The Impact of Megatrends on the Infrastructure Industry*, <https://www.gihub.org/futures/> (accessed 31 Jul. 2020).

54. See, for example, *Sector Coupling in Europe: Powering De-carbonization*, <https://data.bloomberglp.com/professional/sites/24/BNEF-Sector-Coupling-Report-Feb-2020.pdf> (accessed

that could probably be undertaken using lower emission technologies, subject to the development of relevant innovations and replacement of existing equipment and fleets, requiring sizeable investment. Nuclear energy is also an alternative.⁵⁵

Reducing only power-generating GHG emissions to zero would not meet broader goals, since power only accounts for part of energy systems emissions.⁵⁶ It would require greater electrification of the entire economy, likely causing many residential and commercial properties to shift to electric vehicles and electric heating, thereby further increasing power demand.⁵⁷ Low-carbon gases are likely to play a key role in the energy mix.⁵⁸

The trend towards energy efficiency is usually followed because it implies a return on investment, but decarbonization many times implies a loss of economic value.⁵⁹ Many assets will become stranded, meaning they will have to be retired before the end of their useful life in order to meet reduction targets, causing a fall in value and leading to losses of both capital and income for owners as well as increased market and credit risk for lenders and investors. The estimated losses are large: from USD 1 trillion to USD 4 trillion, when considering the energy sector alone, or up to USD 20 trillion when looking at the economy more broadly.⁶⁰ In Latin America, 'implementing NDCs as they stand and correcting course in 2030 to reach carbon neutrality before 2050 would create USD 90 billion worth of stranded assets in the power sector'. This will also imply some potentially negative socio-economic effects, such as for workers and communities on the transformed sectors.⁶¹ Together with inertia, political and economic forces are powerful and seek to ensure continuity of the current fossil fuel

31 Jul. 2020); Energy Transitions Commission, *Mission Possible*, <http://www.energy-transitions.org/mission-possible> (accessed 31 Jul. 2020), or IRENA, *Global Renewables Outlook*, *supra* n. 20, at 81.

55. IEA, *World Energy Outlook*, *supra* n. 12, at 91.

56. See: Ronnie Belmans and Jan Mertens, *The Molecules of the Energy Transition*, *supra* n. 41, at 6; or McKinsey, *Redefining the Power Industry*, *supra* n. 50, at 5.

57. See: McKinsey, *Global Energy Perspective 2019: Reference Case*, <https://www.mckinsey.com/industries/oil-and-gas/our-insights/global-energy-perspective-2019#:~:text=The%20Global%20Energy%20Perspective%20Reference,the%20energy%20transition%20will%20unfold.&text=Global%20energy%20related%20emissions%20will,usage%20in%20the%20power%20sector.> (accessed 31 Jul. 2020); and IDB and Deep Decarbonization Pathways for Latin America and the Caribbean, *Getting to Net-Zero Emissions: Lessons from Latin American and the Caribbean*, *supra* n. 12, at 39.

58. Michael E. Webber, *Research Is Necessary to Accelerate Our Transition to a Zero-Carbon World*, *supra* n. 38, at 5.

59. See, for example, R. Green, *Climate Change: Energy Companies Face \$ 25tn Risk from Carbon Bubble*, 4 IBA Global Insight (October/November 2018); or Sarah Breeden's speech *Avoiding the Storm: Climate Change and the Financial System*, <https://www.bankofengland.co.uk/speech/2019/sarah-breeden-omfif> (accessed 31 Jul. 2020).

60. Network for Greening the Financial System, *A Call for Action: Climate Change as a Source of Financial Risk*, 16-17, https://www.banque-france.fr/sites/default/files/media/2019/04/17/ngfs_first_comprehensive_report_-_17042019_0.pdf (accessed 31 Jul. 2020); see also: James Cust and David Manley, *The Carbon Wealth of Nations: From Rents to Risks*, in Glenn-Marie Lange, Quentin Wodon and Kevin Carey (eds), *The Changing Wealth of Nations 2018*, <https://elibrary.worldbank.org/doi/pdf/10.1596/978-1-4648-1046-6> (accessed 31 Jul. 2020).

61. See: IDB and Deep Decarbonization Pathways for Latin America and the Caribbean, *Getting to Net-Zero Emissions: Lessons from Latin American and the Caribbean*, *supra* n. 12, at 20 and 32; and IRENA, *Global Renewables Outlook*, *supra* n. 20, at 106.

system.⁶² This is shown, for example, by the fact that despite the increase in global climate finance flows, investment in fossil fuels continues to be higher than investment in climate activities.⁶³ Many corporations are voluntarily working towards decarbonization because it is aligned with their sustainability principles and commitments, as well as expectations of investors, financial institutions, rating agencies, insurance companies, customers, employees and other stakeholders. Growing demand, energy efficiency and decarbonization are signposts for the future of the power industry.

[3] Electricity and Infrastructure

Unlike the situation in the high-income countries, where decarbonization is the main challenge, in the low- and middle-income countries it is expanding energy access and industrialization to create social and economic growth. Electricity demand follows two distinct regional paths. 'In advanced economies, growth linked to increasing digitalisation and electrification is largely offset by energy efficiency improvements. In developing economies, rising incomes, expanding industrial output and a growing services sector push demand firmly up. Developing economies will contribute nearly 90% of global electricity demand growth to 2040, but their demand per person remains 60% lower than in advanced economies.'⁶⁴

The infrastructure investment gap in Latin America is estimated at approximately USD 150 billion per annum. The region lags not only in investment but also in infrastructure quality.⁶⁵ It is home to some 25% of the world's hydroelectric potential, as well as high wind, solar and geothermal power potential. According to IDB, 'the solar and wind potential in the region are sufficient to cover current electricity needs 37 and 16 times over respectively'. Renewable electricity could reach 80% by 2030 affordably, making use of the abundant wind and solar resources available, as their cost continues to decrease, as well as using thermal power and large hydropower facilities. This would be possible as long as hydrological conditions remain favourable as a means to balance the system.⁶⁶

Electricity requirements in the region are expected to increase by more than 91% by 2040.⁶⁷ Some scenarios consider that deep decarbonization could imply an increase

62. WEF, *The A-Z of the Energy Transition: Knowns and Unknowns*, 5, http://www3.weforum.org/docs/WEF_Energy_transition_known_and_unknown_2020.pdf (accessed 31 Jul. 2020).

63. UN, *The Sustainable Development Goals Report*, *supra* n. 24, at 16.

64. IEA, *World Energy Outlook 2019*, *supra* n. 12, at 253.

65. Eduardo Cavallo and Andrew Powell, *Building Opportunities for Growth in a Challenging World*, 68, https://publications.iadb.org/publications/english/document/2019_Latin_American_and_Caribbean_Macroeconomic_Report_Building_Opportunities_to_Grow_in_a_Challenging_World_en.pdf (accessed 31 Jul. 2020).

66. See: Alicia Bárcena and Others, *Economics of Climate Change in Latin America and the Caribbean*, *supra* n. 34, at 42; and IDB and Deep Decarbonization Pathways for Latin America and the Caribbean, *Getting to Net-Zero Emissions: Lessons from Latin American and the Caribbean*, *supra* n. 12, at 30.

67. Lenin H Balza, Ramón Espinasa and Tomas Serebrisky, *Lights on? Energy Needs in Latin America and the Caribbean to 2040*, <https://publications.iadb.org/publications/english/document/Lights-On-Energy-Needs-in-Latin-America-and-the-Caribbean-to-2040.pdf> (accessed 31 Jul. 2020).

in electricity generation of between 210% and 560%. There is an estimated potential for clean energy investment opportunities by 2040 of USD 1 trillion.⁶⁸ Despite significant hydroelectric potential, these projects involve longer time frames, high risk and construction of dams, as well as changes to river systems and their ecosystems, requiring detailed environmental impact assessments. System transitions could allow the region to leapfrog directly onto the new standard in underdeveloped areas.⁶⁹ As cheaper renewable and decentralized solutions become available, they are more likely to be used, especially when they are also faster and easier to deploy. Where possible, it is simpler and cheaper to build from scratch than transform existing infrastructure. Moreover, further disruptive technological developments could change the options available. This would be the case, for example, if the Iter fusion project were successful and a source of unlimited energy was available.⁷⁰ Thus, we can contemplate being techno-optimistic and consider that innovation can make once scarce resources abundant,⁷¹ boosting socio-economic development.

[C] CLIMATE CHANGE DISPUTES

[1] Overview of Climate Change Litigation

Climate change litigation cases have increased steadily in the last decade. There is a wide variety of climate change-related disputes. Many claims attracting the attention of the press and academia have a public law edge and present challenging legal issues, such as the application of public trust doctrine, justiciability, defining sources of climate obligations, causation and remedies available. Judges, arbitrators, dispute boards and experts are increasingly being asked to deal with arguments and facts related to climate change and climate science that did not exist previously, based on public or private law. This global trend is pushing boundaries, prompting policy and behavioural change, thereby creating a growing body of global precedent. Claimants are bringing novel and creative legal arguments⁷² and, courts, arbitration tribunals and

68. IDB and Deep Decarbonization Pathways for Latin America and the Caribbean, *Getting to Net-Zero Emissions: Lessons from Latin American and the Caribbean*, *supra* n. 12, at 30 and 39.

69. WEF, *The A-Z of the Energy Transition: Knowns and Unknowns*, *supra* n. 62, at 7.

70. For more information on the Iter Project see: <https://www.iter.org/> (accessed 31 Jul. 2020).

71. This is the main thesis of Peter Diamandis in his book *Abundance*. Peter Diamandis, *Abundance: The Future Is Better Than You Think*, (Free Press, Kindle edition, 2015).

72. See: United Nations Environment Programme, *UN Report on the Status of Climate Change Litigation, A Global Review 2017*, *supra* n. 1; Joana Setzer and Rebecca Byrnes, *Global Trends in Climate Change Litigation: 2019 Snapshot: Policy Report*, http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2019/07/GRI_Global-trends-in-climate-change-litigation-2019-snapshot-2.pdf (accessed 31 Jul. 2020); Sophie Marjanac and Lindene Patton, *Extreme Weather Event Attribution Science and Climate Change Litigation: An Essential Step in the Causal Chain?*, 36 *Journal of Energy & Natural Resources Law* 3, 265-298 (2018); Evan Healey, et al., *The Divergent Climate Change Approaches of the EU and the US: an Analysis of Contributing Factors*, 34 *Journal of Energy & Natural Resources Law* 4, 465-481 (2019).

experts are demonstrating willingness to take innovative approaches to these issues in some cases.⁷³ Climate change is creating a new and uncertain legal context.

As Miles and Swan explain, lawyers 'need to be cognisant of the increasing business risk from climate change, and the role of the lawyer in risk management'.⁷⁴ In this scenario, organizations such as ICC and IBA have made a valuable investment in producing reports on related legal issues. ICC Report researches and reflects on the role of arbitration and ADR in relation to new issues in contractual disputes with a climate change element. In 2014, IBA published a report entitled 'Achieving Justice and Human Rights in an Era of Climate Disruption' (IBA Report).⁷⁵ This report provides a wide-ranging overview of international law challenges related to the human cost of climate change and provides practical guidelines to improve the international legal environment.⁷⁶ IBA Report highlighted several key ideas for discussion and adopted the following definition of climate justice: 'To ensure communities, individuals and governments have substantive legal and procedural rights relating to the enjoyment of a safe, clean, healthy and sustainable environment and the means to take or cause measures to be taken within their national legislative and judicial systems and, where necessary, at regional and international levels, to mitigate sources of climate change and provide for adaptation to its effects in a manner that respects human rights.'⁷⁷

73. See, for example, Petra Minnerop, *Integrating the 'Duty of Care' under the European Convention on Human Rights and the Science and Law of Climate Change: The Decision of The Hague Court of Appeal in the Urgenda Case*, 37 *Journal of Energy & Natural Resources Law* 2, 149-179 (2019); Don C Smith, *Landmark Climate Change-Related Judicial Decisions Handed Down in the Netherlands and Australia: A Preview of What's to Come?*, 37 *Journal of Energy & Natural Resources Law* 2, 145-147 (2019); Don C Smith, 'No Ordinary Lawsuit': *Will Juliana v United States Put the Judiciary at the Centre of US Climate Change Policy?*, 36 *Journal of Energy & Natural Resources Law* 3, 259-264 (2018); Suryapratim Roy and Edwin Woerdman, *Situating Urgenda v the Netherlands Within Comparative Climate Change Litigation*, 34 *Journal of Energy & Natural Resources Law* 2, 165-189 (2016); Lesley Hughes, *The Rocky Hill Decision: A Watershed for Climate Change Action?*, 37 *Journal of Energy & Natural Resources Law* 3, 341-351 (2019); Jaap Spier, *There Is No Future Without Addressing Climate Change*, 37 *Journal of Energy & Natural Resources Law* 2, 181-204 (2019).

74. Wendy Miles and Nicola Swan, *Climate Change and Dispute Resolution*, *supra* n. 2, at 127.

75. IBA, *Achieving Justice and Human Rights in an Era of Climate Disruption*, *supra* n. 1, at 2.

76. See, for example, Stephen Humphreys, *Climate Change: Too Complex for a Special Regime*, 34 *Journal of Energy & Natural Resources Law* 1, 51-56 (2015).

77. See, for example, Sara L Seck and Michael Slattery, *Business, Human Rights and the IBA Climate Justice Report*, 34 *Journal of Energy & Natural Resources Law* 1, 75-85 (2016); Sharon Mascher, *Climate Change Justice and Corporate Responsibility: Commentary on the International Bar Association Recommendations*, 34 *Journal of Energy & Natural Resources Law* 1, 57-69 (2016); Jessica M Smith, *Climate Change Justice and Corporate Responsibility*, 34 *Journal of Energy & Natural Resources Law* 1, 70-74 (2016); Stephen Humphreys, *Climate Change: Too Complex for a Special Regime*, 34 *Journal of Energy & Natural Resources Law* 1, 51-56 (2016); Nicola Leslie, *IBA Takes Leading Role in Increasing Awareness of Climate Change Justice*, 34 *Journal of Energy & Natural Resources Law* 1, 7-15 (2016); Lee Godden and Maureen Tehan, *REDD+: Climate Justice and Indigenous and Local Community Rights in an Era of Climate Disruption*, 34 *Journal of Energy & Natural Resources Law* 1, 95-108 (2016); Motoko Aizawa, *Staying Human-Centric at the Intersection of Climate Change and Human Rights*, 34 *Journal of Energy & Natural Resources Law* 1, 86-94 (2016); Brian J Preston, *The Adequacy of the Law in Achieving Climate Change Justice: Some Preliminary Comments*, 34 *Journal of Energy & Natural Resources Law* 1, 45-50 (2016); Murray Carroll, *The Geopolitics of Climate Justice: Collective Interest or Raison de système?*, 34 *Journal of Energy & Natural Resources Law* 1, 109-125 (2016).

In 2020, following the recommendations of their report, IBA published a 'Model Statute for Proceeding Challenging Government Failure to Act on Climate Change'.⁷⁸ The model statute seeks to suggest a way forward for individuals and communities to access their courts and challenge government action or inaction on climate change. While IBA has emphasized public law, *ICC Report* focuses on the role of arbitration and ADR in relation to commercial disputes. These consider contractual controversies regardless of whether the parties involved are private or public. As the topic is very broad and sometimes difficult to grasp, it is useful to group commercial climate change disputes according to subject matter. We propose classifying these disputes into four categories.

The first group comprises all those controversies that will arise in relation to the huge investments that will be required to make the world more sustainable. This category covers disputes related to investments required to transform industry, power networks, transport, home equipment and so on. The subject matter of these disputes will be mainly the usual issues arising from commercial contracts related to investments.⁷⁹ These disputes will be contractual in nature with the common thread that one of the parties, or someone along the contractual chain, will enter the contract seeking to achieve a specific transition objective.

The second group includes disputes related to adaptation and mitigation measures, generally fostered by governments, including many controversies related to changes in laws and regulations. This category covers regulatory measures taken by governments in complying with their own GHG emission reduction targets, including the extent of cost and implications transferred to corporations and citizens along the contractual chains. It could also include regulatory changes that imply shifts in market risk, including changes in subsidy policies. Change in law is a classic topic, regularly addressed in many commercial contracts.

The third category groups disputes related to new standards of funders and investors in relation to their investments or client activities, such as Equator Principles,⁸⁰ United Nations Principles for Responsible Investment⁸¹ or United Nations Guiding Principles on Human Rights. This category mainly covers voluntary commitments assumed by business, adhering either to industry-wide principles or standards or their own social responsibility standards or codes of conduct. These standards will create disputes between business partners, shareholders, groups of companies and contractual chains, within financing and investment relationships as well as in relation to rating agencies, insurance companies and so on. A significant part of the disputes

78. IBA, *Model Statute for Proceeding Challenging Government Failure to Act on Climate Change*, <https://www.ibanet.org/Climate-Change-Model-Statute.aspx> (accessed 31 Jul. 2020).

79. See, for example, Doug Jones, *Energy Arbitrations in the Construction Sector*, *Construction Law International*, (March 2018); or Peter Rees QC and Jess Connors, *Energy Construction and Infrastructure Disputes*, *International Arbitration in the Energy Sector* (Oxford University Press, Kindle edition, 2018).

80. For information on Equator Principles, see: <https://equator-principles.com/> (accessed 31 Jul. 2020).

81. For information on United Nations Principles for Responsible Investment, see: <https://www.unpri.org/> (accessed 31 Jul. 2020).

will likely address whether these standards are incorporated into the contracts, either expressly or implied, and thus if binding on the other party.

The fourth group includes disputes arising due to changes in circumstances, such as force majeure events or whether complying with a contractual obligation has become impossible or excessively onerous. This category covers unexpected events that could affect relationships due to climate change, imposition of new regulations, changes in consumer or economic patterns or otherwise. Naturally, this is likely to be a frequent area of dispute. Legal principles related to this matter are well established,⁸² although the context and circumstances will be different.

These disputes may or may not arise where there is an investment protection treaty in place or where there is a state or public body involved. When analysed independently, the legal issues in dispute are generally well known. Some technical or scientific aspects may be new, but the law itself will generally fit within classic legal parameters. Nevertheless, the volume of disputes and their similarity make it possible to treat them separately. Disputes related to climate change will likely be complex. Moreover, the law may be evolving, creating legal uncertainty in some areas or shifting the inclination of judges, arbitrators and experts.

[2] Collaboration as a Tool to Mitigate Risks and Increase Productivity

Climate change is a game changer and has not generally been considered a risk factor in contractual relationships. It is increasingly becoming foreseeable, as one cannot tell what will happen and when, but it can be said 'with a high degree of certainty that some combination of physical and transition risk will materialise at some point in the future'.⁸³ Thus, parties should include it within their risk assessment for project management and design, as well as assessments of feasibility and return on investment. In the case of long-term energy projects, aspects to be considered include risks of legal changes, voluntary standards, water availability and temperature fluctuations. There is a clear need for better collaboration between all players. Working in partnership as an industry is essential, as no single company, organization, or country can manage the many and various economic, political, environmental and social challenges in this interdependent world.⁸⁴

The construction industry's productivity ratio has been growing annually by around 1% in recent decades, which is exceptionally low in comparison with other

82. See, for example, Klaus Peter Berger and Daniel Behn, *Force Majeure and Hardship in the Age of Corona: A Historical and Comparative Study*, 6 McGill Journal of Dispute Resolution (2019/2020) 4, 79-130.

83. Sarah Breeden's speech 'Avoiding the Storm: Climate Change and the Financial System', *supra* n. 59, at 4.

84. See, for example, GIF, *Infrastructure Futures: The Impact of Megatrends on the Infrastructure Industry*, *supra* n. 53; and Arcadis, *Global Construction Disputes 2020*, 41, <https://www.arcadis.com/en/united-states/our-perspectives/global-construction-disputes-report-2020/> (accessed 31 Jul. 2020).

industries.⁸⁵ One of the reasons is a lack of trust and collaboration. There is potential for increasing efficiency within the industry that could amount to savings of USD 1.6 trillion per annum. With savings like this, the entire Latin American infrastructure gap⁸⁶ could be closed ten times.

One of the main problems of the construction industry is fragmentation of activities. Instead of a single organization delivering a project, most projects are designed and constructed by a multitude of designers and trade contractors.⁸⁷ The parties' interests are not aligned, which fuels confrontation, increases transaction costs and inhibits value creation. The adversarial approach and the strategy of transferring as many risks as possible have not been working and have actually increased the number of disputes.⁸⁸ In a context where controversies are likely to rise because of climate change and other unexpected situations, such as pandemics, we need to rethink the way projects are undertaken. Collaboration is considered the key factor for reducing fragmentation. As John Egan stated:

If we are to extend throughout the construction industry the improvements in performance that are already being achieved by the best, we must begin by defining the integrated project process. It is a process that utilises the full construction team, bringing the skills of all the participants to bear on delivering value to the client. It is a process that is explicit and transparent, and therefore easily understood by the participants and their clients.

The rationale behind the development of an integrated process is that the efficiency of project delivery is presently constrained by the largely separated processes through which they are generally planned, designed and constructed. These processes reflect the fragmented structure of the industry and sustain a contractual and confrontational culture.

The conventional construction process is generally sequential because it reflects the input of designers, constructors and key suppliers. This process may well minimise the risk to constructors by defining precisely, through specifications and contracts, what the next company in the process will do. Unfortunately, it is less clear that this strategy protects the clients and it often acts as an effective barrier to using the skills and knowledge of suppliers and constructors effectively in the design and planning of the projects.

Moreover, the conventional processes assume that clients benefit from choosing a new team of designers, constructors and suppliers competitively for every project they do. We are far from convinced of this. The repeated selection of new teams in

85. McKinsey Global Institute, *Reinventing Construction: A Route to Higher Productivity*, 1, <https://www.mckinsey.com/~/media/McKinsey/Industries/Capital%20Projects%20and%20Infrastructure/Our%20Insights/Reinventing%20construction%20through%20a%20productivity%20revolution/MGI-Reinventing-Construction-Executive-summary.ashx> (accessed 31 Jul. 2020).

86. As mentioned above (*supra* n. 65), the infrastructure investment gap in Latin America is estimated at around USD 150 billion per year.

87. See, for example, Howard Ashcraft, *Integrated Project Delivery: A Prescription for an Ailing Industry*, (Construction Law International, December 2014) or Martin Fischer and others, *Integrating Project Delivery*, (Wiley, 2017).

88. According to the 2019 statistics of ICC, construction disputes amount to 25% of the total and energy sector disputes 16%. ICC, Dispute Resolution 2019 Statistics, <https://iccwbo.org/publication/icc-dispute-resolution-statistics/> (accessed 31 Jul. 2020).

our view inhibits learning, innovation and the development of skilled and experienced teams. Critically, it has prevented the industry from developing products and an identity – or brand – that can be understood by its clients.⁸⁹

The collaborative approach fosters integration of different teams working on a project, trying to align their interests. There is a direct relationship between transaction costs and the degree of trust and collaboration between parties. Transaction costs mean that value is being lost at some point. Trust also creates conditions to motivate the parties to help each other, increasing knowledge, attention and resources available for project success. Thus, increasing trust creates value through collaboration.⁹⁰ Globally, interpersonal trust has decreased in recent years⁹¹ and Latin America has a low trust ratio; this is part of the challenge.⁹²

The International Standardization Organization (ISO) has published ISO 44001,⁹³ showing that collaboration can be planned and structured through processes and does not need to rely on spontaneity. This is a sound approach, because structure can strongly influence and even determine behaviour.⁹⁴ Collaboration does not imply leaving aside contracts, but rather enhancing communication between parties. Ideally, it should make multiparty communication possible, allowing identification of blind spots, available resources and flexibility, clarifying priorities and recognizing areas where cooperation can be enhanced as well as finding and handling risks. Collaboration allows the parties to go beyond the contract if they consider it appropriate, fostering commercial good faith.

89. John Egan, *Rethinking Construction*, (The Construction Task Force, 1998), 18-19.

90. This is true for organizations and society as a whole. There is abundant research pointing out the importance of trust and teamwork on organizations, see, for example, Patrick Lencioni, *The Five Dysfunctions of a Team* (Wiley, Kindle edition, 2002); Heidi Gardner, *Smart Collaboration: How Professionals and Their Firms Succeed by Breaking Down Silos* (Harvard Business Review, 2017), Heidi Gardner, *Getting Your Stars to Collaborate*, 100-108 (Harvard Business Review, January-February 2017); Frances Frei and Anne Morriss, *Begin with Trust* (Harvard Business Review, May-June 2020) or Martine Haas and Mark Mortensen, *The Secrets of Great Teamwork* (Harvard Business Review, June 2016). In relation to society, several economists relate the degree of trust within a society to economic and social development. See, for example, Amartya Sen, *Development as Freedom*, 262-265 (Oxford University Press, 1999); Francis Fukuyama, *Trust* (Simon & Schuster, 1995), Yann Algan and Pierre Cahuc, *Trust and Growth*, 5 Annual Review of Economics, 521-549 (2013); Paul Zak and Stephen Knack, *Trust and Growth*, 1-39, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=136961 (accessed 31 Jul. 2020). In relation to the construction industry, the current trend towards a more collaborative approach shows that the industry recognizes that the traditional adversarial approach has fuelled inefficiencies. As McKinsey indicates: 'There is a need to move away from the hostile contracting environment that characterizes many construction projects to a system focused on collaboration and problem solving.' McKinsey Global Institute, *Reinventing Construction: A Route to Higher Productivity*, *supra* n. 85, at 8. The discussion on the benefits of collaboration in construction contracts is summarized and developed further in: David Mosey, *Collaborative Construction Procurement and Improved Value* (Wiley Blackwell, 2019) and Martin Fischer and others, *Integrating Project Delivery*, *supra* n. 87.

91. See, for example, *Edelman Trust Barometer 2020*, <https://www.edelman.com/trustbarometer> (accessed 31 Jul. 2020).

92. See, for example, Esteban Ortiz-Ospina, *Trust*, <https://ourworldindata.org/trust>.

93. ISO, *Collaborative Business Relationship Management Systems: Requirements and Framework – ISO 44001*, (ISO, 2017).

94. Howard Ashcraft, *Integrated Project Delivery: A Prescription for an Ailing Industry*, *supra* n. 87.

The decision-making process could be seen as more complicated, as it has to consider the point of view of other parties. Some may also fear that collaboration could open Pandora's box. Transparency could be seen as a risk because it may imply showing weaknesses. If all parties do not share a collaborative mindset, one party could opportunistically take advantage of the other's weakness, destroying any collaboration. This is not about blind trust, but rather trust built on transparency, respect and measured accountability to meet commitments.⁹⁵ Parties might also fear sharing confidential information and know-how, such as how they organize their business, costs, and supply chain management strategies. Therefore, it is advisable to enter into a collaboration agreement in order to frame the processes that parties will implement.⁹⁶

The development of highly collaborative schemes has led to a new project delivery method, which creates a multiparty virtual organization to align the interests of the different organizations involved, sharing risks and rewards. The underlying principles applicable to teamwork within a single organization are also applicable to the various teams/organizations within the project. Teams should trust one another, engage in unfiltered conflict around ideas, commit to decisions and plans of action, hold one another accountable for delivering against those plans and focus on the achievement of collective results. Although apparently simple, 'it is extremely difficult because it requires levels of discipline and persistence that few teams can muster'.⁹⁷

The California Council of the American Institute of Architects, for example, defines Integrated Project Delivery (IPD) as 'a project delivery method that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of design, fabrication and construction. The IPD method contains, at a minimum, all of the following elements: continuous involvement of owner and key designers and builders from early design through project completion; business interests aligned through shared risk/reward, including financial gain at risk that is dependent upon project outcomes; joint project control by owner and key designers and builders; a multi-party agreement or equal interlocking agreements; and limited liability among owner and key designers and builders'.⁹⁸

While IPD is validly considered an independent project delivery method, other delivery methods, such as design bid build, design and build or construction management, can benefit from the collaborative philosophy⁹⁹ and incorporate one or more integration processes. This can be undertaken to a certain extent in a bilateral contract, as when using an NEC4 Engineering and Construction Contract,¹⁰⁰ especially when

95. The American Institute of Architects, California Council, *Integrated Project Delivery: An Updated Working Definition*, 12, https://aiacalifornia.org/wp-content/uploads/2014/08/AIACA_IPD.pdf (accessed 31 Jul. 2020).

96. David Mosey, *Collaborative Construction Procurement and Improved Value*, *supra* n. 90, at 135.

97. Patrick Lencioni, *The Five Dysfunctions of a Team*, *supra* n. 90, at 189-190.

98. The American Institute of Architects, California Council, *Integrated Project Delivery: An Updated Working Definition*, *supra* n. 95, at 4.

99. John Spittler and Eric Nelson, *Where Is Project Delivery Headed?*, 748.5 (AACE International Transactions, 2011).

100. For information on NEC contracts see: <https://www.neccontract.com/> (accessed 31 Jul. 2020).

certain optional clauses are used;¹⁰¹ or in a much more comprehensive way using multiparty contracts such as the Framework Alliance Contract 1 (FAC1)¹⁰² or NEC4 Alliance Contract. Virtuous project dynamics that a fully collaborative project delivery method creates go beyond the sum of the different processes. Nevertheless, transaction costs can be reduced and value can be created by implementing one or more single collaborative processes.

Transparency and teamwork along the contractual chain are key to creating one reliable source of truth about the actual situation, identifying real constraints, issues of primary and secondary importance for each party and gaining clarity about potential areas of flexibility, to benefit from different points of view and take advantage of the aggregate resources of all parties (from subcontractors to end client): economics, finance, equipment, materials, technology, know-how and contacts. In summary, the benefits of collaboration clearly surpass any risks of adopting an adversarial approach. Collaborative processes could be used in several project areas, for example, in relation to cost and schedule control, value engineering, supply chain collaboration, joint risk management and early contractor involvement. Due to the direct relationship with the mitigation of climate change risk, the following sections comment briefly on early contractor/bidders involvement, joint risk management and amicable settlement.

[3] Early Contractor and Bidders Involvement

A review of more than three hundred global industrial megaprojects with budgets greater than USD 1 billion shows that 65 % failed to meet business objectives. In some industrial sectors, the failure rate was as high as 75 %. Most, but not all, failed projects were unprofitable. If this happened without high climate change risk, now the possibility of failure increases. Edward Merrow summarizes seven key mistakes seen frequently in megaprojects,¹⁰³ and comments:

This book is mostly about mistakes, often masked with the bravado of ‘taking daring risks’, but in the end just plain mistakes. So, I thought it appropriate to start our discussion of megaprojects with seven whopper mistakes that doomed too many of these projects from the start. For the most part, the engineers on these

101. Such as Option X12 (Multiparty Collaboration), Option 20, Option X22 (Early Contractor Involvement), Option C (Target Cost with activity schedule).

102. For information on FAC1 see: <https://allianceforms.co.uk/about-fac-1/> (accessed 31 Jul. 2020).

103. The author states that: ‘While each of these mistakes amount to a wide discussion, the seven key mistakes pointed out by the author can be summarized as follows: (1) allocating the project’s potential value in a way that does not provide a stable foundation on which the project can be executed; (2) putting pressure to move a project along quickly from the outset creating dangerous shortcuts and an opportunistic attitude; (3) implementing a project even though there is a lack of definition of the underlying business; (4) skimping on the front-end engineering definition of the project; (5) unreasonably trying to reduce costs; (6) unreasonably allocating risk to a party that is not in a position to handle it; (7) firing project managers for overruns, what creates an incentive to hide overruns. As the author says, the previous seven mistakes are not mutually exclusive; they can and do show up together in many combinations. However, any one is usually sufficient to doom a project to failure.’ Edward Merrow, *Industrial Megaprojects*, 2-8 (Kindle ed., Wiley, 2011).

projects tend to make little mistakes, although some of them occasionally cascade into disaster. Most big mistakes are made by senior business managers in the sponsoring firms. The reason they make most of the big mistakes is because they have control of the things that matter most: strategy, money, and people. In most megaproject developments, the most important single relationship among the many thousands of relationships involved is the one between the business director for the project and the project manager, often called the project director.¹⁰⁴

As the author indicates, one of the key mistakes in large projects consists in skimping on the front-end engineering definition. This is clear from the number of disputes generated by poor-quality engineering/specifications. In the context of Public-Private Partnerships (PPP), this is also indicated by the number of addendums that such projects often face.¹⁰⁵ Climate change is moving all parties out of stability into permanent instability and uncertainty. Projects need to be adaptable and agile in adopting changes. In long-term projects, such as energy projects, the materialization of climate change risk is highlighting weaknesses in designs, reliability, cost calculations and overall fitness for purpose. The challenge is planning for the unexpected, which requires significantly more engineering and studies than previously needed.¹⁰⁶

Overinvestment in design and engineering is generally good advice,¹⁰⁷ even more so in the context of climate change. Thus, the G20 Infrastructure Working Group (IWG) has identified improvement in project development as one of three overarching pillars needed to develop infrastructure as an asset class, along with improving the investment environment and promoting greater standardization.¹⁰⁸ This extra effort to refine the front-end engineering/conceptual definition of projects can be undertaken by the sponsor alone, but it would be better with the collaboration of bidders interested in the project, contributing their know-how. Early involvement of bidders in project optimization is not very common in Latin America but is increasingly expanding and would be a significant contribution to project development. This can be undertaken in many

104. *Ibid.*, 1-2.

105. As Quiñones and Aliaga indicate regarding the Peruvian experience, many addendums in PPP projects are caused by poor planning and structuring of the contract, including lack of adequate technical studies, inadequate risk allocation and unrealistic schedules. María Teresa Quiñones and Jenny Aliaga, *La renegociación de contratos de concesión en el Perú. Aproximación teórica y empírica a sus causas y consecuencias*, *Ius et Veritas* 58, 86-108 (2019). Also, see, for example, Contraloría General de la República, *Causas y efectos de las renegociaciones contractuales de las Asociaciones Público – Privadas en el Perú*, 270-277, http://doc.contraloria.gob.pe/estudios-especiales/estudio/2015/Estudio_renegociaciones_contractuales_APP_.pdf (accessed 31 Jul. 2020).

106. McKinsey. *Redefining the Power Industry*, *supra* n. 50, at 10.

107. McKinsey Global Institute. *Reinventing Construction: A Route to Higher Productivity*, *supra* n. 85, at 75.

108. IWG, *Roadmap to Infrastructure as an Asset Class*, https://www.oecd.org/g20/roadmap_to_infrastructure_as_an_asset_class_argentina_presidency_1_0.pdf (accessed 31 Jul. 2020). Following this need, the Global Infrastructure Hub (GIH) has published a practical guide on project preparation. GIH, *Leading Practices in Governmental Processes Facilitating Infrastructure Project Preparation*, https://cdn.gihub.org/umbraco/media/2344/gih_project-preparation_full-document_final_art_web.pdf (accessed 31 Jul. 2020).

ways, but it is frequently undertaken through early contractor involvement in construction projects and through competitive dialogue in PPP projects and public procurement. In relation to early contractor involvement, Mosey states:

Early contractor involvement is a feature of collaborative procurement through which, by an early appointment in advance of start on site, 'the contractor has the opportunity to contribute his knowledge of the market and his experience, and the employer has the benefit of an open book system, enabling him to assess whether the contractor is offering a fair price and good value'...

Early contractor involvement should not be confused with a two stage tendering system by which bidding contractors are expected to offer speculative design contributions as part of a short-listing or negotiation process, with no clarity as to whether their efforts will lead to appointment or the award. By contrast, early contractor involvement should be governed by a conditional appointment setting out the joint processes by which additional information is completed to a level of detail sufficient for the parties then to agree that the project should proceed to construction. Early contractor involvement should also describe the process by which the team move from the preconstruction phase to the construction phase with minimum negotiation ...

It has been suggested that early contractor involvement may create only an unenforceable agreement to agree future prices, and this is a risk if preconstruction phase processes are not clearly spelled out in a contract.¹⁰⁹

Another alternative is using the two-stage open book system of pre-construction phase project processes. It requires early appointment of a full project team to work up detailed proposals on the basis of an open book cost that meets the client's stated outcomes, with cost benchmarking as a second stage. The two-stage open book model reduces industry bidding costs, enables faster mobilization and provides an opportunity for clients to work with a single integrated team testing design from an earlier stage, dealing with cost and risk issues ahead of the on-site start, following the full project award at the end of the second stage.¹¹⁰ NEC4 Engineering and Construction Contract also provides an optional clause (Option X22) for implementing early contractor involvement.¹¹¹

Competitive dialogue is used in many jurisdictions around the world and is increasingly contemplated in Latin America.¹¹² While this scheme generally only

109. David Mosey, *Collaborative Construction Procurement and Improved Value*, *supra* n. 90, at 30-31.

110. David Mosey, *Project Procurement and Delivery Guidance: Using Two Stage Open Book and Supply Chain Collaboration*, https://constructingexcellence.org.uk/wp-content/uploads/2015/12/Two_Stage_Open_Book_Guidance.pdf (accessed 31 Jul. 2020).

111. For a commentary on NEC4s Option X22 and other contracts that contemplate early contractor involvement *see*, for example, David Mosey, *Collaborative Construction Procurement and Improved Value*, *supra* n. 90, at 165-186.

112. *See*, for example, Chapter V of UNCITRAL's Model Law on Public Procurement, available at: <https://www.uncitral.org/pdf/english/texts/procurem/ml-procurement-2011/2011-Model-Law-on-Public-Procurement-e.pdf> (accessed 31 Jul. 2020). *See also*: Javier Cid Vega, *Diálogo Competitivo en el Contexto de las Asociaciones Público-Privadas en la Unión Europea*, in William Gallo and Others, *Derecho Administrativo para el Siglo XXI*, 247-261 (Forum, 2018); <https://dialnet.unirioja.es/servlet/libro?codigo=716645> (accessed 31 Jul. 2020); Jair Alfonso González Peña, *El Diálogo Competitivo como instrumento para la maduración de proyectos de*

applies to complex projects, the principle of optimizing the specifications with the bidders' collaboration is valuable good practice. In competitive dialogue, the client works together with bidders on refining the project's front-end engineering or conceptual definition. After a structured process, the client awards the contract to one of the tenderers.¹¹³ Although this methodology significantly increases the chances of a successful project, in times of increasing uncertainty it is even more pertinent. Thus, early collaboration between the parties is a key tool to tackle climate change risk.

[4] Joint Risk Management

Risk can be avoided, shared, transferred, mitigated or accepted, but it cannot be ignored.¹¹⁴ Project risk management in construction seeks to manage the possibility of positive and negative events arising from the design and construction process, including contexts in which stakeholder interests exist. The risk management objective is to increase the probability or impact of positive risks and decrease the probability or impact of negative risks.¹¹⁵ Risk management is the most effective technique to avoid disputes.¹¹⁶ Collaborative procurement does not approach risk only in terms of its transfer or allocation; it involves additional reviews and enquiries through which team members challenge their own and each other's risk assumptions when it is still possible to mitigate.¹¹⁷ This approach allows team members to identify risks affecting a project as soon as possible, in order to agree on the status and strategies for different types of risk. However, joint risk analysis will only benefit the project if actions are undertaken on the basis of the results.¹¹⁸

Contracts should include a structured, collaborative joint risk management procedure.¹¹⁹ This is proven best practice. The procedure would include tasks, a timetable and assignment of responsibilities. Ideally it would be an actual agreement,

infraestructura vial, <https://repository.urosario.edu.co/handle/10336/12583> (accessed 31 Jul. 2020); Programa para el Impulso de Asociaciones Público-Privadas en Estados Mexicanos, *Asociaciones Público-Privadas para el Desarrollo de Infraestructura y la Provisión de Servicios Públicos, Experiencia del Reino Unido*, <https://piappem.org/file.php?id=234> (accessed 31 Jul. 2020); Joan Ridao i Martín, *La colaboración entre el sector público y el sector privado en proyectos complejos de infraestructuras y servicios públicos. Una revisión crítica del marco legal en España*, *Revista Española de Ciencia Política* 34, 89-117 (March 2014). In the case of Peru, for example, competitive dialogue for PPP projects is contemplated in Art. 44 of Legislative Decree No. 1362 and Arts 62-75 of Supreme Decree 240-2018-EF. In Europe, Art. 30 of Directive 2014/24/EU regulates competitive dialogue.

113. Directive 2014/24/EU considers that competitive dialogue has shown itself to be of use in cases where contracting authorities are unable to define the means of satisfying their needs or of assessing what the market can offer in terms of technical, financial or legal solutions. Directive 2014/24/EU. p. L 94/71-72.

114. Michael Latham, *Constructing the Team*, 14, <https://constructingexcellence.org.uk/wp-content/uploads/2014/10/Constructing-the-team-The-Latham-Report.pdf> (accessed 31 Jul. 2020).

115. Project Management Institute (PMI), *The Construction Extension to the PMBOK Guide*, 23 (2016).

116. Arcadis, *Global Construction Disputes*, *supra* n. 84, at 11.

117. David Mosey, *Collaborative Construction Procurement and Improved Value*, *supra* n. 90, at 347.

118. *Ibid.*

119. *Ibid.*

not just an informal document. This agreement would ideally be multilateral, including subcontractors, end users and other stakeholders. Risk management can address issues collaboratively through exchanges of data leading to agreements on design, cost, time and risk, with early input from the principal contractors/sub-contractors ahead of on-site start, as well as through an early warning system and a joint decision-making group seeking intelligent solutions, based on data previously established and agreed. When drafting risk management procedure, we must consider six key aspects: risk planning, risk identification, risk analysis, response planning, monitoring and response implementation.¹²⁰

ISO 44001 sets the requirements and framework for implementing collaborative business relationship management systems. This standard provides good guidance regarding implementation of any collaborative process and is a key reference document when implementing collaborative processes. It is important to maintain an accurate view of the real project situation and, in so far as possible, ensure that this view is shared by the parties involved. This would allow all parties to contribute, controlling precise understanding of the situation.

Clear understanding is required, regardless of contractual stipulations, because reality goes beyond contracts. At a later stage, the contract can be considered in order to verify the party's rights and obligations or whether the parties wish to adopt a more flexible, commercial approach. Collaborating to analyse different perspectives on the project makes it possible to create a single source of truth. This is key, as it ensures that everyone is working based on one agreed version of the truth with regard to project drawings, schedules, Key Performance Indicators (KPIs) and cost overruns.¹²¹ This is of particular relevance in construction projects and even more crucial in uncertain contexts.

Blame-and-sue culture inhibits transparency and productivity; an attitude shift is essential. However, this does not mean waiving contractual rights. The individual team members are essential and therefore the team must be organized. Collaborating organizations are likely to have their own approaches to risk management. Therefore, the approach to be used within the relationship should be established and agreed. There should be a risk manager responsible for managing the agreed joint process.

The main tool for coordination is the joint risk register. This document should incorporate any risks previously identified by each organization and those resulting from any interdependency. It helps ensure that the parties share the same perspective and goes beyond the identifying process, to reflect agreement regarding risk ownership allocation, responsibilities, use of unified terminology and language, as well as definition of pertinent metrics. This register shall be a dynamic document, periodically reviewed. Identified risks should be reassessed, information should be updated, and

120. PMI, *The Construction Extension to the PMBOK Guide*, *supra* n. 115, at 99-111. Also see: Association for the Advancement of Cost Engineering (AACE), *Total Cost Management Framework*, 2nd ed. (2015); AACE, *Skills and Knowledge of Cost Engineering*, 6th ed (2015); AACE, *Recommended Practice 57R-09: Integrated Cost and Schedule Risk Analysis Using Monte Carlo Simulation of a CPM Model* (2019).

121. McKinsey Global Institute, *Reinventing Construction: A route to Higher Productivity*, *supra* n. 85, at 75.

effectiveness of response actions and control measures should be monitored and evaluated. One of the most relevant uses of the joint register is to encourage multiparty early warning. Collaborative joint risk management is improving the traditional approach and constitutes a valuable tool to mitigate unexpected and uncertain times.

[5] Amicable Settlement

When disputes are complex, or legal uncertainty exists, it is generally good advice to follow a more commercial rather than a strictly legal approach. A commercial view frames the dispute within the bigger picture and the relationship between the parties and the project as a whole. As we face climate change, the importance of amicable settlement must be stressed.¹²² It allows the parties to maintain control of the dispute, placing it within the general context of their commercial relationship and allowing negotiation based on interests beyond the specific dispute or the law. It is the simplest and cheapest method to resolve conflicts¹²³ and disputes can also provide an opportunity to strengthen commercial relationships. Furthermore, early involvement of the parties can help narrow the dispute, contributing to efficient management in the unfortunate case of escalation.

When a third party (an expert, dispute board, arbitration tribunal or a court) is engaged in dispute resolution, its mandate is narrowed by the dispute itself and has little flexibility to address wider complexity and interests of the parties. End users of dispute resolution mechanisms are seeking help to settle their differences more efficiently, in particular, through improved opportunities to reach amicable settlements. The growing preference for alternative mechanisms in conflict resolution can be seen in various surveys of practice and expectations.¹²⁴ Thus, engagement of the parties is key to avoid losing control of the dispute and creating greater harm.

122. For a discussion on how to foster amicable settlement of international construction contracts disputes see: Eric Franco, *How to Foster Amicable Settlement of International Construction Contracts Disputes?*, 1 ICC Dispute Resolution Bulletin, 30-40 (2020).

123. Nael Bunni, *The FIDIC Forms of Contract*, 441 (3rd ed., Blackwell Publishing, 2005).

124. This has gained special relevance within the arbitration field: 'The arbitration community has recognized that changes are needed to meet the needs of users. It is time that this recognition is extended to the need to encourage settlement.' Justin Williams, James Glaysheer, *The Settlement Deficit in Arbitration* (GAR, 17 Sep. 2018). In the international arbitration study undertaken by Queen Mary University and White & Case in 2018, we observe that almost half of those questioned indicated that their preferred method for resolution of international disputes is a mix of alternative methods and arbitration. Those questioned were: 60% in-house legal counsel (final users), 46% external lawyers and 43% arbitrators. This indicates that final users do not consider arbitration alone to be sufficiently efficient as a dispute resolution mechanism. *2018 International Arbitration Survey: The Evolution of International Arbitration*, <http://www.arbitration.qmul.ac.uk/research/2018/> (accessed 31 Jul. 2020). Likewise, the *Global Pound Conference Series: Global Data Trends and Regional Differences 2017* from the International Mediation Institute indicated that the combination of adjudicative and non-adjudicative mechanisms, either in parallel or in prior stages, is perceived as the most efficient combination to resolve commercial disputes. International Mediation Institute, *Global Pound Conference Series: Global Data Trends and Regional Differences*, 13-14, file:///C:/Users/ericf/Downloads/Global-Data-Trends-and-Regional-Differences.pdf (accessed 31 Jul. 2020).

Lawyers and dispute resolution consultants tend to be very sceptical of regulated amicable settlement. Nonetheless, both the parties and in-house legal departments should be guided by the contract in order to understand: (1) the relevance of amicable process; (2) how to conduct an effective and efficient amicable settlement process; (3) an internal justification to negotiate without a position of perceived weakness; and (4) how to reduce the risk of careless dispute handling by disengaged employees. Adequate involvement of the parties is essential for amicable settlement. Any laudable efforts by advisors, lawyers or third parties will be fruitless if the parties are not engaged. It is neither obvious nor intuitive as the first reaction when a dispute arises is to delegate the problem to a neutral third party. Dispute resolution end users should therefore consider clear wording for their multi-tiered dispute resolution clause to encourage negotiation and provide for participation of senior representatives or executives in the process, in order to maximize efficiency.

[6] Dispute Escalation

If the parties are unable to resolve the dispute directly and decide to engage a third party, they can make use of the full range of *ADR* and dispute resolution tools, techniques, and mechanisms. *ICC Report* explains this spectrum in detail and there is abundant informative literature available.¹²⁵ As stressed by *ICC Report*, the most significant differentiating factor in climate change disputes is arguably ensuring availability of appropriate expertise, due to the fact that these disputes may be related to novel technical matters. *ICC Report* identifies this as one of six broad features that could enhance existing procedures to further improve their effectiveness for resolving disputes related to climate change.¹²⁶

Classic legal topics arise when dealing with disputes related to climate change, applicable to either the substance of the matter or the dispute resolution procedure, such as pros and cons of multistage escalation dispute resolution clauses, whether to appoint a lawyer or a non-lawyer, whether to include expertise requirements for the arbitrators, the possibility of a tribunal with more than three arbitrators.¹²⁷ Climate change-related disputes which escalate to arbitration or litigation are likely to be complex, and thus it is advisable for the parties to do their utmost to try settling the dispute at an earlier stage.

[D] CONCLUSION

Climate change is a reality. Energy systems transition is ambitious, and this will inevitably generate disputes. We must anticipate this and consider how to avoid and manage such disputes as efficiently as possible. In Latin America, a region where 76.8% of its population belongs to the low-income or lower-middle-income strata, the

125. See, for example, John W. Hinchey, *Rethinking Resolution of Construction Disputes*, *Construction Law International*, (March 2020).

126. See *supra* n. 2.

127. These aspects are addressed in *ICC Report*.

challenge is to expand energy access and industrialization in order to achieve sustainable socio-economic growth. The opportunity to leapfrog directly into the new low-carbon standard should be seized. However, we must consider that this region is particularly vulnerable to climate change, mainly because of the distribution of water resources and uneven social and economic development.

Although most examples of commercial contract climate change-related disputes can be classified within traditional categories of the law and general dispute prevention and resolution tools, techniques and mechanisms apply to them, their relation to recurring factual circumstances and the volume of disputes justifies studying them as a group. *ICC Report* has focussed the spotlight on climate change commercial disputes. These disputes can be classified by focusing on the underlying contracts that give rise to the disputes, as *ICC Report* does. However, from a different perspective, it is useful to group them into four categories by identifying the subject matters in dispute: (1) those related to investments required to make the world more sustainable; (2) those related to adaptation and mitigation measures; (3) those related to new voluntary social responsibility standards applicable to funders, investors, insurance companies and credit rating agencies; and (4) those arising due to changes in circumstances. Focusing on the subject matter in dispute helps understand the type of disputes and anticipate better how to address these areas of risk when developing a project. All these types of disputes are likely to increase. It would be difficult to say which type will arise most frequently, as this will largely depend on where activity develops, for example if there is more change in law, change in circumstances or huge investments and divestments. In any case, it is likely that all these areas will surge.

In addition to discussing arbitration and *ADR* tools, techniques and mechanisms that can be used when dealing with these disputes, the wider discussion should consider good practice and techniques to avoid and handle disputes before they escalate to a dispute board, expert, mediator, arbitration, or court. Thus, practical ways of mitigating the effects of climate change risk include adopting a collaborative approach, considering early engagement of contractors or bidders, as well as establishing joint risk management procedures and providing proper conditions to increase the probabilities of an amicable settlement. When resources are scarce and needs profound, as in many parts of the world, we must make every effort to increase project development efficiency, especially in the context of the important challenges posed by climate change.