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## Climate change and national laws across Commonwealth countries

Paper by the Commonwealth Secretariat\*

### *Summary*

This paper furthers the Commonwealth agenda on climate action by exploring the kinds of ‘practical and swift action’ that might be taken through national legal frameworks to implement the Paris Agreement. The paper reviews national laws of Commonwealth member countries as they currently apply to and intersect with climate change. The paper investigates legal measures that relate *directly* to implement climate change policy, including climate change legislation and regulatory instruments such as emissions trading schemes and energy efficiency measures. It also considers *indirect* legal measures that can provide ‘co-benefits’ in relation to climate change policy, such as waste legislation and air quality measures. The paper presents examples of these different kinds of climate intersections in different Commonwealth legal systems, highlighting examples of what has worked well and what has not worked well to date, within different legal, economic and political cultures, and in different geographies and climates.

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## I. Introduction

Commonwealth law ministers and senior officials previously considered climate change issues at their meeting in Gaborone, Botswana, in 2014. At that meeting, senior officials had before them a paper entitled ‘Climate change issues in the Commonwealth: Subsistence resources and climate change-related forced migration’.<sup>1</sup> That paper had been prepared in response to the Commonwealth Law Ministers Meeting (CLMM) recommendations in Sydney, Australia, 2011, which referred to the conduct of an assessment of the adequacy of legal frameworks as applicable to populations displaced due to climate change, both within states and between states, as well as access to vital natural resources.<sup>2</sup>

At their meeting in 2014, senior officials agreed that Commonwealth action under the purview of law ministers in the area of climate change should be consistent with the United Nations Framework Convention on Climate Change (UNFCCC), and should not duplicate work carried out at the international level, in light of the global nature of the climate change challenge.<sup>3</sup>

Significant developments in international action against climate change have since occurred, with further work conducted by the Intergovernmental Panel on Climate Change (IPCC),<sup>4</sup> and the negotiation and signing of the 2015 Paris Agreement under the auspices of the UN Framework Convention on Climate Change.<sup>5</sup>

The *Fifth Assessment Report* of the IPCC highlighted that there has been ‘unequivocal’ warming of the climate system with many ‘unprecedented’ observed changes since the 1950s.<sup>6</sup> Anthropogenic greenhouse gas emissions and other anthropogenic drivers are ‘extremely likely to have been the dominant cause of the observed warming since the mid-20th century’.<sup>7</sup> Projected future climate change impacts include increased surface temperature, with more frequent and longer heat waves, more intense and frequent extreme precipitation events, ocean warming and acidification, and sea level rise.<sup>8</sup>

Continued climate change will amplify existing risks and create new risks for human populations, with the risks generally greater for disadvantaged communities.<sup>9</sup> The IPCC

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<sup>1</sup> Paper prepared by the British Institute of International and Comparative Law on behalf of the Commonwealth Secretariat: Meeting of Senior Officials of Commonwealth Law Ministries (SOLM)(14)4 / Commonwealth Law Ministers Meeting (CLMM)(14)8 [Provisional].

<sup>2</sup> Meeting of Commonwealth Law Ministers and Senior Officials, Sydney, Australia (11–14 July 2001), Communiqué.

<sup>3</sup> Meeting of Senior Officials of Commonwealth Law Ministries, Gaborone, Botswana (Monday 5 May 2014).

<sup>4</sup> Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Synthesis Report*, contribution of Working Groups I, II and III to the *Fifth Assessment Report* of the Intergovernmental Panel on Climate Change (core writing team, RK Pachauri and LA Meyer [eds]) (IPCC, Geneva, Switzerland 2014).

<sup>5</sup> United Nations Framework Convention on Climate Change Conference (UNFCCC) of the Parties, Paris Agreement, FCCC/CP/2015/10/Add.1 (2015).

<sup>6</sup> *Ibid*, 2–3.

<sup>7</sup> *Ibid*, 6–8.

<sup>8</sup> *Ibid*, 10.

<sup>9</sup> *Ibid*, 13ff.

observes that mitigation and adaptation are ‘complementary approaches’ to reducing climate risk, with mitigation capable of ‘substantially’ reducing climate impacts in the latter decades of this century and benefits from adaptation already available.<sup>10</sup>

Recognising this critical challenge, the Paris Agreement contained measures to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low-carbon future. As of 2 March 2018, 174 Parties (out of 195 signatories) had ratified the Paris Agreement.

Immediately prior to the adoption of the Paris Agreement, the Commonwealth Leader’s Statement on Climate Action underlined the importance of ‘practical and swift action’ to reinforce the outcomes of the 2015 Paris Climate Conference.<sup>11</sup> One important area in which practical and swift action can be taken concerns the role of national law in supporting the mitigation, adaptation, and capacity-building goals of the Paris Agreement across the Commonwealth. This is broader than the issues of population displacement and access to vital natural resources previously considered by Commonwealth law ministers, and concerns a wide range of intersections between national laws and issues of climate change. Climate change is a pervasive and collective problem. It implicates and is affected by a wide range of governance and regulatory measures within any given legal system.

Accordingly, this paper investigates the breadth of national laws of Commonwealth member countries as they ‘intersect’ with the problem of climate change, highlighting key examples in Commonwealth countries. The legal areas covered are wide, in order to reflect developments at the international level. The focus of the paper, however, is squarely on implementation of international climate agreements at the national level, through national legal frameworks.

For the purposes of this paper, relevant ‘legal intersections’ with issues of climate change are defined as those national legislative or regulatory measures:

- whose primary purpose is to achieve climate policy objectives;
- that take into account climate change issues or impacts; or
- that have important implications for climate change generally, greenhouse gas (‘GHG’) emissions and/or climate change adaptation.

This definition of legal intersections captures the direct and indirect ways in which climate change as a problem is affected by national laws of various types.

In mapping the different kinds of legal intersections with climate change in national legal systems, the report focuses first on examples of *direct intersections*. These are national laws that explicitly address or consider climate change causes or impacts. This includes measures of two types: (1) laws and regulations whose primary purpose is to achieve climate policy objectives, and (2) laws that are designed for non-climate purposes, but that take into account climate change issues or impacts explicitly within their broader framework. These include overarching climate change laws, laws imposing GHG emissions reporting and accounting obligations, renewable energy and energy market decarbonisation measures, energy efficiency laws, land use and infrastructure

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<sup>10</sup> *Ibid*, 17–18.

<sup>11</sup> Commonwealth Leaders’ Statement on Climate Action (28 November 2015) para 9.

planning regulations, water and forestry management law, transport measures, corporate law duties, subsidy regulation, and taxation measures and financial frameworks relating to climate change funding.

The report also considers examples of *indirect intersections*. These are national laws and regulations that have the capacity to significantly affect GHG mitigation and climate change adaptation outcomes through their operation, including by providing ‘co-benefits’ in terms of climate change policy. Such indirect intersections can be found in laws relating to air and water pollution, stratospheric ozone layer protection, waste management, and forest and vegetation management.

In applying this analytical framework to Commonwealth nations, a key purpose of the report is knowledge sharing, providing examples of legislative and regulatory developments that relate to climate change across the legal systems of Commonwealth countries. In this respect, it should be kept in mind that, while countries may find good practice examples in the laws of other countries, use of legal examples from other legal systems and cultures will need to take into account the economic, governance, geographical, and climate context of those systems.

In some countries, for instance, emissions levels are high due to heavily polluting industries, presenting a particular challenge and an obvious target for climate mitigation policies. Other countries, by contrast, may have a lower overall emissions profile, with agriculture, land use change and deforestation being the main cause of GHG emissions due to subsistence farming needs rather than logging. The level of ambition in a country’s carbon policy is also driven by development goals, industrial priorities, as well as cultural and legal values, such as constitutional rights to a clean environment.

The paper is a review of relevant law rather than a survey of the far broader category of climate policies, which may or may not be implemented through law and regulation. Further, it draws key examples of laws and regulatory measures from a diverse range of Commonwealth countries, but no single legal system is mapped comprehensively for its climate change-related law. The paper does not closely investigate enforcement of the laws described, but it does highlight examples of major enforcement successes or challenges. The paper is also a snapshot of a moment in time. This is a fast-moving area of law and legislative development.

## II. **Climate change law: the international law framework and its impact on national legal systems**

Areas of international law relevant to climate change include, among others, international environmental law, the law of the sea, and trade and investment law. All of these international regimes frame national responses to climate change. The UNFCCC and its associated agreements and decisions of the Conference of Parties to the Convention (COP) are of central importance in this respect. Agreed in 1992 and entering into force in 1994, the UNFCCC sets the goal of preventing ‘dangerous anthropogenic interference with the climate system’ and prescribes principles and commitments, the latter being differentiated as between Annex I (developed countries and economies in transition) and non-Annex I (developing countries).

All parties to the UNFCCC undertake a common set of commitments,<sup>12</sup> while developed countries and other Annex I parties undertake additional commitments.<sup>13</sup> It is up to each party to implement their UNFCCC commitments through domestic policy and law. Indeed, the UNFCCC ‘[r]ecogniz[es] that States should enact effective environmental legislation, [and] that environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply’.<sup>14</sup> All Commonwealth member states are parties to the UNFCCC.

Under the UNFCCC, the 1997 Kyoto Protocol (which entered force in 2005) prescribed emission reduction targets for most developed countries. With the Kyoto Protocol covering an ever-diminishing proportion of global emissions in a second commitment period which has yet to enter legal force (for want of ratifications), intergovernmental negotiations continued on the development of a UNFCCC implementing agreement of universal application, resulting in the 2015 Paris Agreement, which entered force in 2016. The agreement departs from differentiation of countries on the basis of the convention’s annexes, in favour of differentiation between ‘developed’ and ‘developing’ countries ‘in the light of different national circumstances’.<sup>15</sup>

The Paris Agreement includes long-term goals on limiting global temperature increases<sup>16</sup> and achieving a balance between anthropogenic emissions and removals by sinks of greenhouse gases.<sup>17</sup> The Agreement does not require particular climate mitigation and adaptation actions or targets, as these are nationally determined. It does, however, require state parties to participate in certain processes, including the communication of a nationally determined contribution (NDC) concerning climate action every five years,<sup>18</sup> with each successive NDC representing a progression of the individual country’s ambition.<sup>19</sup> It also requires a ‘global stocktake’ of national actions and international co-operation every five years, with the first in 2023,<sup>20</sup> and an enhanced transparency framework concerning both national actions and international support.<sup>21</sup> The Agreement includes provisions that create legal obligations on parties as well as provisions in the nature of recommendations or aspirations.<sup>22</sup>

The key role of NDCs in the Paris Agreement places a large reliance on domestic legislation and regulation to implement national contributions,<sup>23</sup> although the

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<sup>12</sup> UNFCCC, art 4(1).

<sup>13</sup> UNFCCC, art 4(2). Developed parties, but not Annex I economies in transition, undertake still further commitments under UNFCCC, art 4(3)–(5).

<sup>14</sup> UNFCCC, recital 10.

<sup>15</sup> Paris Agreement, art 4(4).

<sup>16</sup> Paris Agreement, art 2(1)(a).

<sup>17</sup> Paris Agreement, art 4(1).

<sup>18</sup> Paris Agreement, art 4(9).

<sup>19</sup> Paris Agreement, art 4(3).

<sup>20</sup> Paris Agreement, art 14.

<sup>21</sup> Paris Agreement, art 13.

<sup>22</sup> Lavanya Rajamani, ‘The 2015 Paris Agreement: Interplay Between Hard, Soft and Non-Obligations’ (2016) 28(2) JEL 337.

<sup>23</sup> The UNFCCC’s 2015 INDC synthesis report, which analysed 119 INDCs, found that the requirement to communicate INDCs resulted in ‘new institutional arrangements and consultation processes’ and acted as ‘an incentive to initiate’ climate policies: ‘Synthesis Report on the Aggregate Effect of the Intended Nationally Determined Contributions: Note by the Secretariat’, FCCC/CP/2015/7 (30 October 2015), paras 162, 227.

Agreement does not specify how parties are to implement their contributions in national law (or otherwise). Most countries submitted the first iteration of their national contributions in the form of intended nationally determined contributions (INDCs).<sup>24</sup> Most INDCs ‘build on and/or are embedded in existing climate change and/or development strategies, policies and legislation’, with many INDCs ‘already backed by existing national laws’.<sup>25</sup> A United Nations synthesis report on INDCs additionally found that ‘[s]ome Parties noted that the implementation phase of their INDCs will involve strengthening laws and regulations on climate change and further integrating related objectives into long-term economic and social development plans’.<sup>26</sup>

The UNFCCC also impacts national legal systems as a provider of capacity-building, finance, technology transfer and other means of support, including through the UNFCCC’s Financial Mechanism (the Global Environmental Facility and Green Climate Fund),<sup>27</sup> Technology Mechanism (the Technology Executive Committee and Climate Technology Centre and Network),<sup>28</sup> the Kyoto Protocol’s Clean Development Mechanism (CDM) and other bodies.<sup>29</sup> An example of this is the creation of national legislation or regulation to manage domestic participation in the CDM.

Other agreements of international environmental law are also relevant to climate change and can impact on national legal systems. These include the United Nations Convention on Biological Diversity and its Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets,<sup>30</sup> the UN Convention on the Law of the Sea, and the Chicago Convention on International Civil Aviation. In relation to the latter treaty, the International Civil Aviation Organization (ICAO) adopted in 2016 a global market-based measure for regulating GHG emissions from international aviation, the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which will begin with a voluntary pilot phase in 2021.<sup>31</sup> Also in 2016, states adopted the Kigali Amendment to the Montréal Protocol on Substances that Deplete the Ozone Layer. The

<sup>24</sup> UNFCCC, INDCs as communicated by parties  
<<http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx>> accessed 2 March 2018.

<sup>25</sup> ‘Aggregate Effect of the Intended Nationally Determined Contributions: An Update, Synthesis Report by the Secretariat’, FCCC/CP/2016/2 (2 May 2016), para 21.

<sup>26</sup> *Ibid*, para 21.

<sup>27</sup> UNFCCC, Climate Finance  
<[http://unfccc.int/cooperation\\_and\\_support/financial\\_mechanism/items/2807.php](http://unfccc.int/cooperation_and_support/financial_mechanism/items/2807.php)> accessed 2 March 2018.

<sup>28</sup> UNFCCC, *Technology Mechanism – Enhancing climate technology development and transfer*,  
<[http://unfccc.int/ttclear/templates/render cms\\_page?TEM\\_home](http://unfccc.int/ttclear/templates/render cms_page?TEM_home)> accessed 2 March 2018.

<sup>29</sup> Member states can regulate their interactions with these UNFCCC bodies through either policy or legislation, or some combination of the two. For example, Mauritius has legislated to require that it ‘encourage and assist project developers in applying for carbon credits for energy efficiency projects using the Clean Development Mechanism’ (Mauritius, Energy Efficiency Act 2011, s 6(j)). See also South Africa’s Regulations for the establishment of a Designated National Authority for the Clean Development Mechanism (2005).

<sup>30</sup> Aichi Target 15 calls on countries to enhance ecosystem resilience and the contribution of biodiversity to carbon stocks including by restoring at least 15 per cent of degraded ecosystems. See also Targets 5, 7, 10 and 11: Convention on biological diversity, *Aichi Biodiversity Targets* <<https://www.cbd.int/sp/targets/>> accessed 2 March 2018.

<sup>31</sup> ‘Historic agreement reached to mitigate international aviation emissions’, ICAO, 6 October 2016, Montréal, <https://www.icao.int/Newsroom/Pages/Historic-agreement-reached-to-mitigate-international-aviation-emissions.aspx> (accessed 2 March 2018).

amendment, due to enter force in 2019, commits parties to phase down the production and use of hydrofluorocarbons (HFCs), which contribute to climate change.<sup>32</sup> In addition, the climate change relevance of the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD) to climate change is recognised in UNCCD article 8 and operationalised in the UNCCD's 10-Year Strategic Plan.<sup>33</sup>

Also likely to influence domestic law are the Sustainable Development Goals (SDGs), which were adopted by the United Nations General Assembly in 2015 as the 2030 Agenda for Sustainable Development.<sup>34</sup> Of particular relevance to climate change, Goal 7 concerns energy, Goal 13 concerns climate change, and Goal 15 concerns terrestrial ecosystems, including forest management. Goal 13, which acknowledges the UNFCCC as the 'primary international, intergovernmental forum for negotiating the global response to climate change', includes five targets, among them Target 13.2: to '[i]ntegrate climate change measures into national policies, strategies and planning'.<sup>35</sup>

International law can also have an indirect impact on national laws regarding climate change. For example, World Trade Organization (WTO) law includes the non-discrimination principles of most-favoured nation and national treatment.<sup>36</sup> While there are exceptions to these non-discrimination principles,<sup>37</sup> in recent years there have been a number of WTO disputes in which states have alleged that WTO members have breached WTO obligations by favouring domestic renewable energy firms.<sup>38</sup> There are also WTO rules on the imposition of unlawful subsidies,<sup>39</sup> which WTO member states need to have in mind when supporting particular industries. WTO disputes considering these various principles are discussed below in the context of national measures supporting renewable energy sectors.<sup>40</sup>

### III. National laws and climate change: Direct legal intersections

<sup>32</sup> Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Kigali, 15 October 2016, <https://treaties.un.org/doc/Publication/CN/2016/CN.872.2016-Eng.pdf> (accessed 2 March 2018).

<sup>33</sup> UNCCD, Decision 3/COP.8 [2007], The 10-year strategic plan and framework to enhance the implementation of the Convention, especially strategic objectives 1-3 and operational objectives 1-3.

<sup>34</sup> Resolution adopted by the General Assembly on 25 September 2015, 70/1, 'Transforming our World: the 2030 Agenda for Sustainable Development', A/RES/70/1 (21 October 2015).

<sup>35</sup> United Nations Sustainable Development Knowledge Platform, Sustainable Development Goals <<https://sustainabledevelopment.un.org/?menu=1300>> accessed 2 March 2018.

<sup>36</sup> World Trade Organization, 'Principles of the Trading System' <[https://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/fact2\\_e.htm](https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact2_e.htm)> accessed 2 March 2018.

<sup>37</sup> See, for example, articles XX and XXI of the General Agreement on Tariffs and Trade (GATT) and article XIV of the General Agreement on Trade in Services. For a discussion of GATT disciplines as they relate to energy, see Francis N Botchway, 'International Trade Regime and Energy Trade' (2001) 28 *Syracuse Journal of International Law and Commerce* 1. WTO law provides for the differential treatment of developing countries in certain circumstances. For an overview, see Ellen Hey, 'Common but Differentiated Responsibilities' in *Max Planck Encyclopaedia of Public International Law* (Oxford University Press 2011).

<sup>38</sup> *Canada – Certain Measures Affecting the Renewable Energy Generation Sector*, Report of the Appellate Body (6 May 2013) WT/DS412/AB/R; *Canada – Measures Relating to the Feed-in Tariff Program*, Report of the Appellate Body (6 May 2013) WT/DS426/AB/R; *China – Measures Concerning Wind Power Equipment*, Request for Consultations (6 January 2011) WT/DS419/1; *US – Countervailing Duty Measures on Certain Products from China*, Report of the Appellate Body (18 December 2014) WT/DS437.

<sup>39</sup> See WTO Agreement On Subsidies And Countervailing Measures ('SCM Agreement').

<sup>40</sup> See Part III below (on 'Subsidy Regulation').

Against the international background context described above, this Part considers the ways in which national legal measures can pursue climate change policies, or otherwise incorporate the causes or impacts of climate change explicitly within national legal frameworks. These are the ‘direct’ legal intersections with climate change in national legal systems. Reviewing these intersections is not a straightforward exercise, as climate change issues arise across a range of sectors, responses to climate change can be mobilised in a range of legal ways, and the impacts of climate change can also vary considerably. This Part identifies and categorises a range of legal measures that directly intersect with climate change, which together make up the body of ‘climate change laws’ at the national level.

### ***Overarching legal obligations***

In the first instance, countries may use domestic law to create overarching obligations both for government and for other state actors, in relation to climate change. ‘Overarching obligations’ may include high-level obligations to take mitigation or adaptation action, or to take climate change causes or impacts into consideration, across sectors, across policy areas, and/or across economic domains. Most obviously, governments may be subject to legally binding climate change mitigation obligations, often through ‘economy-wide’ mitigation targets. Similarly, national law may contain requirements to prepare national adaptation plans, as under section 58 of the United Kingdom Climate Change Act 2008.

While there are an increasing number of ‘climate change acts’ around the world,<sup>41</sup> relatively few are found in Commonwealth countries.<sup>42</sup> Two notable climate statutes in Commonwealth countries are found in the United Kingdom and in Papua New Guinea. These are examined in Boxes 1 and 2.

#### ***Box 1 United Kingdom: Climate Change Act 2008***

The United Kingdom Climate Change Act 2008 was one of the first bespoke climate change statutes in the world. It has led to many other states introducing, or contemplating the introduction of, framework climate legislation. Key features of the act include: a binding emissions reduction target of reducing the ‘net carbon account’ by 80 per cent by 2050 against a 1990 baseline of UK emissions;<sup>43</sup> a requirement to set legally binding carbon budgets for each five-year period working towards that goal, which cap the amount of GHGs to be emitted within those periods;<sup>44</sup> the establishment of a Committee on Climate Change that advises the government on the setting of carbon budgets and how these might be met within the economy as a whole, as well

<sup>41</sup> LSE Grantham Research Institute on Climate Change and the Environment, ‘Climate Change Laws of the World’ <<http://www.lse.ac.uk/GranthamInstitute/legislation/>> accessed 2 March 2018.

<sup>42</sup> Note that there are other Commonwealth examples, including in the states or provinces of member countries, such as the SA, Australia, Climate Change and Greenhouse Emissions Reduction Act 2007, which sets long-term carbon mitigation targets, as well as interim renewable energy targets, for South Australia.

<sup>43</sup> The ‘net carbon account’ is defined as the amount of net UK emissions (the amount of UK emissions reduced by the amount of UK removals for the period) reduced by the carbon units credited to the UK carbon account and increased by the carbon units to be debited from the UK carbon account. There is a limit on how many carbon units can be credited to the UK carbon account through buying carbon units from carbon mitigation efforts outside the UK.

<sup>44</sup> Budgets through to 2032 are now set.



as preparing reports on progress to parliament; powers for introducing emissions trading schemes; and an obligation on the minister for energy and climate change to report annually to parliament on national emissions, including net emissions and emissions removals, for the previous year.

One notable aspect is the independence of the advisory Committee on Climate Change. Its carbon budgets have imposed constraints on decision-making by UK government departments, keeping climate change goals relevant when there are other pressing (usually economic) demands on government. Another notable feature is the act's central obligation to achieve climate change mitigation against past emissions levels, using 1990 levels of GHG emissions as the relevant baseline. This kind of requirement is particularly relevant in an industrialised country, which has historically high GHG emissions.

***Box 2 Papua New Guinea: Climate Change (Management Act) 2015***

The Papua New Guinea Climate Change (Management Act) 2015 is a good example of a new and ambitiously comprehensive climate change act, which is quite different from the United Kingdom Act. This statute establishes a Climate Change and Development Authority (CCDA) to promote and manage 'climate compatible development through climate change mitigation and adaptation activities'. The CCDA has extensive powers, including administering the Climate Change and Green Growth Trust Fund, raising money through fees and levies for the fund, and establishing planning committees within regulated sectors<sup>45</sup> to plan sectoral regulation for mitigation and adaptation. The act also provides for mitigation targets to be set by the minister on the advice of the CCDA and relevant government departments. These targets are to be set against 'national reference levels', or estimates of what national emissions would have been in the absence of mitigation measures. This is a way of setting mitigation targets in order to allow for economic growth in a developing country, while aiming to minimise carbon intensity within particular sectors. The latter aim is pursued by: requiring individual persons or organisations to prepare mitigation and adaptation plans in regulated sectors; setting general mitigation and adaptation standard and performance level regulations for high-carbon sectors; and establishing fuel and building 'climate standards'.

Another type of overarching legal obligation involves co-ordinating legal control of climate policy, which cuts across diverse areas of government policy, in a single government entity. This is the approach in Tanzania, where the primary environmental protection statute, the Environmental Management Act 2004, confers broad powers on the environment minister, in consultation with other ministries, to: take measures to address climate change; issue guidelines to ministries and require them to put in place strategies and action plans on climate change, including adapting school curricula; review and approve any measures by private actors to sequester greenhouse

<sup>45</sup> 'Regulated sectors' under the act include: agriculture/livestock, electricity generation, transport, building materials, forestry, petrol/energy/natural gas refining/distribution, mining, fishing, waste management, and any other sectors declared by the minister (s 53).

gases ‘including those related to the use of land, water, forests or any other ecosystems’; and engage in international climate change policy-making.<sup>46</sup> Through these co-ordinating and comprehensive powers to deal with climate policy, the minister has the legal and institutional support to implement Tanzania’s 2012 National Climate Change Strategy, which is primarily focused on adapting to climate change.

More indirectly, there can be overarching legal obligations imposed on state actors to take into account or to promote sustainable development in decision-making or policy making.<sup>47</sup> Along these lines, detailed statutory requirements to pursue or consider ‘principles of ecologically sustainable development’ exist in most Australian jurisdictions, which include the principle of intergenerational equity that is particularly relevant in the context of climate change.<sup>48</sup> An innovative and ambitious way for imposing overarching sustainability obligations on the state can be found in the new Well-being of Future Generations (Wales) Act 2015, which imposes a duty on every public body in Wales to carry out sustainable development and to pursue ‘well-being goals’ including promoting a prosperous, low-carbon society and developing ecological resilience and the capacity to adapt to climate change. Another notable example is the Australian Environmental Protection and Biodiversity Conservation Act 1999, which requires annual reports of national agencies to include material on how activities accord with and promote ecologically sustainable development.<sup>49</sup>

Other kinds of overarching obligations include: constitutional rights to a clean environment and the preservation of natural resources for future generations;<sup>50</sup> as well as procedural mechanisms, such as Ghana’s Functional Organizational Assessment Tool, which provides for ‘climate change indicators’ in the evaluation of metropolitan, municipal, and district assembly compliance with government policies and regulations and the performance of assembly functions.

Countries that do not have overarching legal mechanisms for taking climate action across sectors will often have overarching climate policies. For example, rather than general climate legislation, Saint Lucia has a National Climate Change Adaptation Policy, updated in 2015, which aims to pursue integrated adaptation actions across all key sectors through institutional and legislative facilitation, adequate financing, and taking concrete actions to prepare for or respond to climate change impacts.<sup>51</sup>

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<sup>46</sup> Tanzania, Environmental Management Act 2004, s 75.

<sup>47</sup> See, for example, United Kingdom, Environment Act 1995, s 4.

<sup>48</sup> See, for example, New South Wales, Protection of the Environment Administration Act 1991, s 6; New South Wales, Environmental Planning and Assessment Act 1979, s 5 (see *Taralga Landscape Guardians Inc v Minister for Planning* [2007] NSWLEC 59 for how the principle of intergenerational equality was used by the NSW Land and Environment Court to allow the development of a wind farm); Australia, Environment Protection and Biodiversity Conservation Act 1999, ss 3 and 3A; Sustainable Planning Act 2009, s 3, 4 and 8; WA, Environmental Protection Act 1986, s 4A; Victoria, Environment Protection Act 1970, ss 1A-1L; SA, Environment Protection Act 1993, s 10; SA, Development Act 1993, s 3; Tasmania, Environmental Management and Pollution Control Act 1994, s 8 and Schedule 1; Northern Territory Environment Protection Authority Act, ss 3 and 7; ACT, Environment Protection Act 1997, s 3D; ACT, Planning and Development Act 2007, ss 6 and 9.

<sup>49</sup> Environmental Protection and Biodiversity Conservation Act 1999 (Cth), s 516A.

<sup>50</sup> Constitution of the Independent State of Papua New Guinea, art 4.

<sup>51</sup> Saint Lucia also has policies on energy policy and building standards, which include commitments to renewable energy and energy efficiency, as well as various draft policies and legislative measures that could

While national climate change policies can have an influential impact on the climate action taken by a country, either in terms of mitigation or adaptation, their legal significance will depend on the legal doctrines and cultures of a particular country. In many cases, policies will be non-binding measures that are vulnerable to revocation or marginalisation, as well as competition from other policies and interests. The main advantage of legislative measures requiring an integrated policy response to climate change challenges is the entrenchment of these measures in the country's governance architecture, making them less vulnerable to repeal or dilution, and more likely to be implemented through the country's legal system. This in turn promotes consistency in decision-making and reduces uncertainty. Both are critical factors in encouraging investment in climate technologies and programmes that pursue climate mitigation and adaptation goals.

### ***Climate change committees***

This section considers the important role of committees of experts in climate regulation. Even where legal measures requiring an overarching response to climate change exist, the complex socioeconomic nature of climate change means that scientific, economic, and other technical advisers are required to inform and guide climate policies across policy spheres and economic sectors. Such committees are increasingly common in Commonwealth countries, and may often be established and regulated by legislation that determines their constitution, powers and duties.

There are different types of climate change committees set up by legislation, although all generally have a role in advising government and are constituted by interdisciplinary experts. In some cases, the advisory role is supported by statutory requirements for the committee's advice to be taken into account by government, as in the case of the United Kingdom Climate Change Act 2008.<sup>52</sup> Other climate change committees can have quasi-executive functions, including more extensive policy-making and revenue raising powers, as in the case of the Papua New Guinea committee outlined above.

Another varying feature of climate change committees is their independence from government. The United Kingdom Committee on Climate Change is independent from government, with a view to providing impartial scientific, economic, technological and social advice on decarbonising the UK economy. Some climate change committees have a similar inter-sectoral planning remit, but are composed of both government and non-government members. The Ghana National Committee on Climate Change, for example, is a multi-stakeholder committee of ministries, departments, agencies, donors, the Parliament of Ghana, civil society organisations, research institutions and the private sector.<sup>53</sup>

Another model of climate change committee can be seen in Pakistan in the form of a court-ordered Climate Change Commission, established by a judgment of the Lahore

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contribute to climate change mitigation. See Saint Lucia, 'Intended Nationally Determined Contribution under the United Nations Framework Convention on Climate Change (UNFCCC)' (17 November 2015). United Kingdom, Climate Change Act 2008, s 9.

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Republic of Ghana, *Ghana's Third National Communication Report to the UNFCCC* (2015) 5. See also Felix Ankomah Asante et al., *Climate Change Finance in Ghana* (Overseas Development Institute, June 2015) 18.

High Court in 2015. This commission is charged with overseeing the government's compliance with its adaptation policy.<sup>54</sup>

### ***Laws relating to the reporting, accounting, and publicising of GHG emissions***

Most countries have legal requirements for reporting net greenhouse gas ('GHG') emissions, ensuring that they meet the reporting obligation on states under article 12 of the UNFCCC, which obliges states to prepare and communicate national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol. Each UNFCCC party may make its own legislative and/or executive arrangements to meet its international GHG reporting obligations. Notably, there has been broad state participation in the submission of GHG inventories, indicating that there exist national regimes for GHG reporting in most UNFCCC countries.<sup>55</sup>

There are two main kinds of national GHG net emissions reporting requirements: (1) those that are imposed upon national agencies to prepare national inventories for the state;<sup>56</sup> and (2) those that are imposed on individual companies or installations to monitor and report on their individual emissions.<sup>57</sup> The latter type of obligation can exist as a corporate reporting requirement (discussed below), or is often used in connection with mitigation measures, such as emissions taxes, climate change agreements between regulators and industry, or participation in emissions trading schemes. These different regulatory strategies are discussed further below.

In terms of accounting methods for measuring GHG emissions, there are considerable complexities and uncertainties involved in emissions accounting. In the first place, countries have different reporting requirements depending on their level of development; most notably, under the Paris Agreement, least developed countries have concessional reporting obligations. Furthermore, some emissions are easier to account for than others. In particular, CO<sub>2</sub> emissions from fossil fuel combustion and industrial processes are typically easier to account for than non-CO<sub>2</sub> gases or CO<sub>2</sub> emissions associated with agriculture, waste and land use.<sup>58</sup>

The UNFCCC and IPPC have issued guidelines on the most rigorous approaches to emissions reporting, but these guidelines make clear that there are methodological choices to be made by individual countries, particularly as to the use of conversion

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<sup>54</sup> *Leghari v Federation of Pakistan* (WP No. 25501/2015).

<sup>55</sup> UNFCCC Annex I Party Greenhouse Gas Inventories are collated online at: [http://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/items/2715.php](http://unfccc.int/national_reports/annex_i_ghg_inventories/items/2715.php) accessed 2 March 2018; Non-Annex I party national communications and biennial update reports are online at: [http://unfccc.int/national\\_reports/non-annex\\_i\\_natcom/items/2716.php](http://unfccc.int/national_reports/non-annex_i_natcom/items/2716.php) accessed 2 March 2018.

<sup>56</sup> See, for example, Ghana's Environmental Protection Agency Act (Act 490), which designates the EPA as the national entity charged with preparing Ghana's GHG inventory.

<sup>57</sup> See, for example, Australia, National Greenhouse and Energy Reporting Act 2007; in the EU, see Regulation 601/2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC [2012] L181/30.

<sup>58</sup> The International Energy Agency only reports on the former: <http://www.iea.org/statistics/topics/co2emissions/> accessed 2 March 2018.

factors, and much can depend on the quality of data gathered.<sup>59</sup> A good example of the level of regulatory complexity involved in designing national regimes for emissions accounting methods can be found in the detailed EU Regulation on the Monitoring and Reporting of Greenhouse Gas Emissions.<sup>60</sup> How national legal frameworks approach emissions accounting and reporting, including ensuring that methods are robust enough to inform climate mitigation goals, represents an important national implementation issue.<sup>61</sup>

In terms of publicising national emissions, GHG emissions reported under the UNFCCC are generally, although not always, publicly available within states. Some states have legislative requirements for publicity of GHG emissions and have dedicated websites with emissions information.<sup>62</sup> For those countries bound by the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which includes Cyprus, Malta and the United Kingdom, there are comprehensive requirements for disseminating, and providing public access to, environmental information.<sup>63</sup> Particular emissions regimes may also have specific disclosure requirements, as in the case of the European Union Transaction Log under the EU Emissions Trading Scheme.<sup>64</sup>

### ***Laws relating to trading of GHG emissions and related mechanisms***

An important aspect of the scientific understanding of climate change is that, because greenhouse gases are long-lived and well mixed in the atmosphere, the geographic location of emissions and removals does not have a material impact on the amount or distribution of warming; what matters is net *global* GHG emissions. Climate change mitigation thus requires reducing net GHG emissions, but not at any specific location. This allows the adoption of flexible mechanisms for pursuing mitigation policies, including the establishment of emissions trading schemes.

A high profile GHG emissions trading scheme is the EU Emissions Trading Scheme (EU-ETS), of which the United Kingdom is (at the time of writing) a participating member. This scheme and its implementation challenges are discussed in Box 3, and can be contrasted with the flexible mechanism for incentivising GHG emissions reductions that now exists in Australia. The Australian example shows how alternative flexible mechanisms can be designed, but can also lead to complexity, which may be a

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<sup>59</sup> IPCC, Decision 24/CP.19, *UNFCCC reporting guidelines on annual inventories for Parties included in Annex I to the Convention*, FCCC/CP/2013/10/Add.3; IPCC Guidelines for National Greenhouse Gas Inventories (2006) <<http://www.ipcc-nggip.iges.or.jp/public/2006gl/>> accessed 2 March 2018.

<sup>60</sup> Commission Regulation (EU) 601/2012 on the monitoring and reporting of greenhouse gas emissions, pursuant to Directive 2003/87/EC [2012] of the European Parliament.

<sup>61</sup> In particular, there is debate about whether GHG emissions accounting should be 'consumption-based' rather than 'production-based'. See Paul G Harris and Jonathan Symons, 'Norm Conflict in Climate Governance: Greenhouse Gas Accounting and the Problem of Consumption' (2013) 13(1) *Global Environmental Politics* 9.

<sup>62</sup> See, for example, United Kingdom, Climate Change Act 2008, s 16, and the UK National Atmospheric Emissions Inventory <<http://naei.defra.gov.uk/>> accessed 2 March 2018.

<sup>63</sup> Convention on Access to information, public participation in decision-making and access to justice in environmental matters (25 June 1998), arts 4 and 5.

<sup>64</sup> European Commission, European Union Transaction Log <<http://ec.europa.eu/environment/ets/>> accessed 2 March 2018.

regulatory obstacle - in particular when seeking to link emissions trading schemes internationally.

**Box 3 Emissions trading schemes (ETs) and flexible emissions mitigation mechanisms**

The EU-ETS is the first and largest international scheme for trading GHG allowances in the world. It covers 45 per cent of the EU's GHG emissions from over 11,000 energy-intensive installations in the power generation and manufacturing industry across 31 countries. The ETS is now in its third phase,<sup>65</sup> and operates on a 'cap-and-trade' principle, whereby an overall cap for covered GHGs emissions is set each year across the ETS area, which is decreased each subsequent year by 1.74 per cent. The installations covered by the scheme are required to surrender allowances each year equivalent to their overall emissions. These allowances are obtained by: (1) purchasing them at auction; (2) being allocated them free of charge for certain installations that are new market entrants or vulnerable to carbon leakage (GHG emissions moving outside the ETS area due to the regulatory costs of the scheme); or (3) being purchased from another participating installation in the scheme (the 'trade' aspect of the ETS). With the cap decreasing automatically each year and an auctioning process for most allowances, in principle the ETS should maintain a robust carbon price that incentivises businesses within the ETS to innovate and reduce their overall emissions. However, the initial two phases of the EU ETS were structured differently, leading to significant challenges for the ETS that are still affecting its operation. In particular, there was no EU-wide cap for emissions and most allowances were freely allocated to assist the scheme in its start-up phase.<sup>66</sup> The result of this is a legacy of excess allowances in the scheme and a persistently low-carbon price, in light of states allocating significant allowances for their own industries. In its third phase, the EU-ETS has undergone significant reform to correct its operation as an emissions trading market, and there are further improvements in the pipeline. These include the establishment of a 'market stability reserve' from January 2019, which will automatically regulate the number of allowances available in the market to prevent over- or undersupply of allowances consistent with the overall cap. In the United Kingdom, the EU-ETS is implemented by secondary legislation, the Greenhouse Gas Emissions Trading Scheme Regulations 2012.

The Australian example is quite different, and is an interesting example of how a flexible mechanism for emissions reduction can take a complex regulatory form. It is an evolution of a planned cap-and-trade ETS for heavily emitting industries, which was abandoned in 2014 after a change in government. The incoming government opted for an alternative approach to mitigation, known as the Emission Reduction Fund (ERF). The ERF has three components: (1) a voluntary emissions abatement accreditation process; (2) a government purchasing process; and (3) a 'safeguard mechanism' that sets absolute emissions limits for large emitters. The voluntary accreditation process allows entities interested in abating emissions to register abatement projects and

<sup>65</sup> Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009, amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the community [2009] OJ L140/63. See the consolidated version of the directive.

<sup>66</sup> Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003, establishing a scheme for greenhouse gas emission allowance trading within the community and amending Council Directive 96/61/EC [2003] OJ L275/32.

receive credits, known as Australian Carbon Credit Units (ACCUs), for every tonne of emissions avoided or sequestered. The government purchasing process is a reverse auction, in which the federal climate regulator - the Clean Energy Regulator - offers forward contracts for the delivery of ACCUs, drawing on the government budget to pay for these contracts and incentivising the initiation and implementation of offset projects.

The ERF safeguard mechanism applies to facilities with direct emissions of greater than 100,000 t CO<sub>2</sub>-e yr<sup>-1</sup>, representing about 50 per cent of national emissions. It sets baseline emission limits for each of the covered facilities based on historical absolute emission levels or emissions-intensity of production, and imposes an obligation on them to keep their net emissions at or below the prescribed baselines.<sup>67</sup> After 2020, the objective is to ensure that all baselines for all new investments and facilities that have experienced significant expansions (a greater than 20 per cent increase in maximum productive capacity) are determined using an industry-specific best practice benchmark approach. Where baselines are exceeded, the facilities must either reduce their direct emissions or purchase offsets (ACCUs<sup>68</sup> and possibly specified international units). To provide additional flexibility, covered entities can choose monitoring periods of up to three years. If a facility exceeds its net baseline over a designated monitoring period, the Clean Energy Regulator can seek enforceable undertakings or injunctions to compel compliance, or impose civil penalties of up to 1.8 million Australian dollars (A\$).<sup>69</sup>

### ***Energy market requirements and regulation***

Energy provision in many countries is legally regulated so as to pursue a range of goals, particularly relating to security of energy supply and price regulation. The legal structures used to do this depend on the extent to which energy generation and supply is privatised within a country, and the extent to which energy generation is centralised. Some countries make use of off-grid micro-generation, for example, that is less susceptible to central control. Depending on the structure of an energy system in a particular country, governments may use different measures to pursue decarbonisation goals, from directing state-owned enterprises to generate or source energy from renewable sources, to regulating private energy markets through legislation, often including the oversight of a regulator.

Countries that have energy use profiles characterised by high-carbon intensity now face a decarbonisation challenge. Structural transformation of energy supply markets in such

<sup>67</sup> Baselines are subject to adjustment where the historic baseline is deemed to be unrepresentative of the facility's 'business-as-usual' emission levels.

<sup>68</sup> Australian carbon credit units are a product of the Carbon Credits (Carbon Farming Initiative) Act 2011, which contains a statutory, project-level carbon offset certification scheme, leading to the generation of offset credits (1 tCO<sub>2</sub>-e avoided or sequestered) known as 'ACCUs'. Participation in the scheme is voluntary. Project proponents wanting to generate ACCUs must register their projects under the legislation, report net avoided emissions or sequestration in accordance with an approved method, and receive credits if their net emissions are below a project-level baseline (i.e. this is a voluntary baseline-and-credit scheme). At the time of writing, there were 33 approved methods covering all major sectors of the economy: electricity generation, direct fuel combustion, transport, fugitives, industrial processes, waste, agriculture and land use. After receiving ACCUs, proponents typically sell them to the Australian government under seven- to ten-year contracts, and the government maintains a fund for this purpose.

<sup>69</sup> Notably, the payment of a penalty does not relieve a facility of the obligation to address its exceedance.

countries involves a long-term strategic vision for the country's energy markets, on both the demand and supply side, and can require complex regulatory change, in light of dual goals to maintain the security and reliability of energy supply for businesses and households while pursuing decarbonisation. While many countries to date have focused on discrete regulatory measures to promote the use of low-carbon energy (as discussed in the next section on renewables obligations), an overall approach to reforming energy markets is important in ensuring a sustainable and smooth transition to a low-carbon economy.<sup>70</sup> This issue is becoming an important policy issue in many countries, particularly where low-carbon energy policies may cause security of supply problems.<sup>71</sup>

Very few countries have introduced overall legislative reform of energy markets to accommodate decarbonisation.<sup>72</sup> One notable example of legislation on decarbonisation and reform of a national energy market is found in the United Kingdom Energy Act 2013.

**Box 4 Energy Act 2013: Decarbonising the UK energy market**

The United Kingdom Energy Act 2013 has two aspects designed specifically to promote decarbonisation of the energy market: decarbonisation targets and energy market reform. The latter includes both a decarbonisation mechanism ('Contracts for Difference') and a measure focused on security of energy supply (known as the 'Capacity Market' tool).<sup>73</sup> On the first measure, decarbonisation targets are to be set by government ministers from 2030, and will work alongside the five-yearly carbon budgets adopted under the Climate Change Act 2008. The targets impose a duty on the government to ensure 'that the carbon intensity of electricity generation in the United Kingdom is no greater than the maximum permitted level of the decarbonisation target range'.<sup>74</sup> The long-term nature of this target and duty reflects the government's awareness of its statutory long-term GHG mitigation goals, balanced against the need to transition to low-carbon sources of energy in an economically feasible way.

To assist with this transition, the act develops a market-based regulatory mechanism for promoting low-carbon sources of energy through the creation of 'Contracts for Difference' (CfDs). These are private contracts awarded to generators of low-carbon energy, which guarantee that the generators receive a certain price for their energy, giving comfort to investors. Under CfDs, generators sell energy into the wholesale electricity market, but to reduce exposure to fluctuating electricity prices they are

<sup>70</sup> This is particularly in light of the intermittency issues associated with most technologies and the challenges this can give rise to in meeting peak demand.

<sup>71</sup> See, for example, South Australia, where energy production from renewable sources (wind and solar) is increasing risks of power supply problems and raising urgent questions of how the energy market and grid should be designed. See: Australian Energy Market Operator (AEMO), *South Australian Electricity Report 2016* (warning of possible power shortages) <[http://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning\\_and\\_Forecasting/SA\\_Advisory/2016/2016\\_SAER.pdf](http://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/SA_Advisory/2016/2016_SAER.pdf)> accessed 2 March 2018.

<sup>72</sup> Saint Lucia has proposed a draft Revised Electricity Supply Act 2015 to contribute to mitigation goals.

<sup>73</sup> The Capacity Market mechanism is vulnerable to criticism that it subsidises current methods of energy production: Terry Macalister, 'Labour condemns "waste of money" energy scheme', *The Guardian* (6 May 2016) <<https://www.theguardian.com/business/2016/may/06/labour-condemns-waste-of-money-capacity-market-energy-scheme>> accessed 2 March 2018.

<sup>74</sup> United Kingdom, Energy Act 2013, s 1(1).



provided a variable top-up supplement from the market price to a pre-agreed ‘strike price’. The electricity suppliers pay for this under a ‘supplier obligation’. However, when the market price exceeds the strike price, the generator is required to pay back the difference, thereby protecting consumers from over-payment. The first allocation round of contracts was in 2014 and the budget was split into two tranches, for established and less-established technologies, to ensure that a range of low-carbon technologies can benefit from the CfD scheme. This mechanism needed to be approved under EU state aid rules, adding a further layer of regulatory complexity.

In addition to this reform package, the UK government introduced a number of supportive measures, including the introduction of a ‘Carbon Price Floor’ (CPF),<sup>75</sup> an ‘Emissions Performance Standard’ for all new large fossil fuel power plants,<sup>76</sup> and is developing plans for a ‘smart’ electricity grid.<sup>77</sup> The CPF introduces, through the Climate Change Levy (discussed below), a tax on electricity generators that ‘tops up’ the EU-ETS carbon price, to provide ‘long-term certainty about the cost of carbon in the UK electricity generation sector’ and to incentivise low-carbon investment. As the EU-ETS carbon price has been very low, UK energy has, as a result, typically cost more than in other EU member states. The CPF was reformed in 2016 to cap the extent to which it can top up the EU carbon price.

Another way in which energy markets are being reformed and decarbonised is through decentralisation, which requires particular attention to grid connectivity. The UNFCCC’s Technology Executive Committee has noted that decentralised renewable energy generation holds particular appeal for rural areas, where the cost of extending the centralised grid would be prohibitive, and that the ‘co-benefits’ of distributed generation are particularly relevant for developing countries.<sup>78</sup>

National energy legislation has begun to provide for distributed renewable energy generation.<sup>79</sup> For example, India’s Electricity Act 2003 requires the central government to ‘prepare and notify a national policy, permitting stand-alone systems... for rural areas’. It requires central and state regulatory commissions, when specifying the terms and conditions for determination of tariffs, to be ‘guided by’, among others, the promotion of co-generation and generation of electricity from ‘renewable sources of energy’. It also provides the State Electricity Regulatory Commission with the function of promoting co-generation and generation of electricity from ‘renewable sources of energy’, by providing suitable measures for connectivity with the grid and sale of electricity to any person.

### ***Renewable energy obligations***

Renewable energy obligations are an increasingly common form of regulation across different countries. One critical feature of this kind of legislation, defining its scope

<sup>75</sup> United Kingdom, Finance Act 2011.

<sup>76</sup> United Kingdom, Energy Act 2013, ch 8 (note that this incentivises carbon capture and storage for all new large-scale coal-fired power plants).

<sup>77</sup> Smart Grid Forum Portal: <<http://uksmartgrid.org/>> accessed 2 March 2018.

<sup>78</sup> UNFCCC Technology Executive Committee, ‘TEC Brief #8 – Facilitating Technology Deployment in Distributed Renewable Electricity Generation’ (November 2015) 3, 7.

<sup>79</sup> UNFCCC, ADP Technical Expert Meetings: Renewable energy supply (Bonn, Germany, 3 June 2015) <<http://unfccc.int/bodies/awg/items/8895.php>> accessed 2 March 2018.

and purpose, is the definition of what counts as a ‘renewable’ form of energy. In Ghana, for example, the Renewable Energy Act 2011 defines renewable energy to include wind, solar, hydro, biomass, biofuel, landfill gas, sewage gas, geothermal energy and ocean energy.<sup>80</sup> By contrast, Kenya’s Energy Act 2006 (Rev 2012) defines ‘renewable energy’ as ‘non-fossil sources including, but not limited to biomass, geothermal, small hydro-power, solar, wind, sewage treatment and plant gas’.<sup>81</sup> Another notable example is the inclusion of waste coal mine gas as a form of renewable energy in Australian law.<sup>82</sup> A number of Commonwealth countries have also legislated to create executive agencies that are obliged to promote renewable energy.<sup>83</sup>

Legal obligations related to incentive-based renewable energy schemes can be divided into obligations for large-scale and small-scale renewable energy generation. In relation to large-scale generation, a common legal approach used in many countries is an obligation on energy suppliers to buy a proportion of their energy from renewable energy sources. This is often called a ‘renewable portfolio standard’. For example, in the United Kingdom<sup>84</sup> energy suppliers have been subject to a ‘Renewables Obligation’ since 2002,<sup>85</sup> which obliges UK electricity suppliers to obtain an increasing proportion of the electricity they supply from renewable sources. Suppliers prove that they have met this obligation by holding sufficient numbers of ‘Renewables Obligations Certificates’ at the end of a given year.<sup>86</sup> Certificates are issued to accredited renewable energy generators for the electricity they generate, and can be traded by operators. This scheme will be phased out, however, as the new UK Energy Market Reform package, discussed above, is implemented.

For small-scale renewable energy generation, the United Kingdom has run a feed-in-tariff scheme for small-scale wind, solar and micro combined heat and power generation (applying to low-carbon generation more broadly).<sup>87</sup> This scheme requires certain licensed electricity suppliers to make tariff payments on the generation and export of renewable and low-carbon electricity.

The Australian renewable energy scheme is also separated into large-scale and small-scale versions of the Renewable Energy Target, under the Renewable Energy (Electricity) Act 2000. These schemes operate similarly to the UK renewable energy schemes, with tradable certificates being provided for the generation of electricity from (mostly) renewable sources. Wholesale purchasers of electricity, who are mostly large electricity retailers, are required to purchase and surrender specified quantities

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<sup>80</sup> The minister for energy may also designate other sources of energy to be renewable energy for the purposes of the act.

<sup>81</sup> Kenya, Energy Act 2006 [Rev 2012], s 2.

<sup>82</sup> Australia, Renewable Energy (Electricity) Act 2000, ss 17 and 17A.

<sup>83</sup> An example is the Malawi Energy Regulatory Authority, Energy Regulation Act 2004, s 9(2)(i). See also the Australian Renewable Energy Agency, established under the Australian Renewable Energy Agency Act 2011.

<sup>84</sup> As an EU member state, the UK is under EU legislative obligations to increase the share of overall energy derived from renewable energy sources to meet fixed targets: Directive 2009/28/EC on the promotion of the use of energy from renewable sources [2009] OJ L140/16.

<sup>85</sup> Since 2005 in Northern Ireland.

<sup>86</sup> Note that where suppliers do not have a sufficient number of ROCs to meet their obligations, they must pay an equivalent amount into a fund. The fund is distributed back to suppliers as a reward in proportion to the number of ROCs they produced in respect of their individual obligation.

<sup>87</sup> The UK FiT scheme applies to solar PV and wind installations with a declared net capacity (DNC) of 50kW or less, or micro combined heat and power with a total installed capacity (TIC) of 2kW or less.

of these certificates each year, thereby guaranteeing that they have provided a certain proportion of electricity to retail customers from renewable sources.

Small-scale generators receive distinct small-scale certificates that are provided upfront on the basis of the expected power generation (or displacement from non-renewable sources) over a 15-year period. Most households that purchase a small-scale system - such as solar panels on domestic premises - assign their rights to generate small-scale certificates from the renewable energy they produce to agents in return for a discount on the purchase price of the system at the outset. The agents receive the rights to generate the certificates, based on the expected renewable energy generation of the system, and are able to sell them into the market. All sellers of small-scale certificates have two options when selling: they can sell on the open market for an uncapped price, or through the small-scale certificate (STC) clearing house at a fixed price of A\$40.

Some renewable energy obligations target particular kinds of renewable energy, as part of a policy of energy market reform to target the development of new energy generation sectors. Thus, in India, the federal government in 2016 amended the Tariff Policy 2006 to increase the renewable purchase obligation to provide that '8 per cent of electricity consumption excluding hydro power, shall be from solar energy by March 2022' and to ban the levy of inter-state transmission charges and losses for solar and wind power.<sup>88</sup>

One challenge with small-scale renewable energy schemes, however, is that if the schemes are very successful, the cost burden of the schemes can become substantial. The UK government, for example, has introduced measures to phase out or reduce feed-in-tariff payments, often quite abruptly, leading to legal challenges.<sup>89</sup> Similar issues have been experienced in Australia since the late 2000s.

#### ***Box 5 Renewable energy obligations: Malaysia***

Malaysia's Renewable Energy Act 2011 is an interesting example of mixing large-scale energy distribution with renewable energy suppliers of various sizes. The act establishes a feed-in-tariff scheme for renewable electricity generators. Holders of distribution licenses under the Electricity Supply Act 1990 are required to buy electricity from Feed-in Approval Holders at prescribed feed-in-tariff rates. Different rates are set for eligible generation types: biomass (inclusive of municipal solid waste), biogas (inclusive of landfill/sewage), small hydro and solar photovoltaic. Feed-in-tariff rates are also adjusted on account of size (the general maximum capacity is 30MW and rates are smaller for larger units), location and time of installation. Generators receive the feed-in-tariff rate for between 16 and 21 years, depending upon on the type of technology (biomass and biogas receive 16 years, while small hydro and solar photovoltaic generators receive 21 years). In order to limit the cost of the scheme, quotas are set for new feed-in approvals in respect of each renewable resource for six-month windows over three-year periods.

<sup>88</sup> Note that certain aspects of the Indian solar feed-in-tariff scheme have been found to infringe international economic law through their domestic content requirements: see para 87.

<sup>89</sup> See, for example, *Secretary of State for Energy & Climate Change v Friends of the Earth* [2012] EWCA Civ 28 (where the court found that retrospective adjustment of solar feed-in-tariff rates was unlawful).

As indicated in the section above on energy market reform, such reform can involve increasing distributed generation of energy, often thus increasing the role of renewable energy production, as seen in the Indian context. As another example, legislation in Cameroon provides that ‘[w]ithin the framework of decentralised rural electrification and in view of constraints related to environmental protection, priority shall be given to distributed generation, from renewable energy sources, except in the event of scarcity, high cost or deficiency thereof’.<sup>90</sup> By its nature, distributed generation involves a wide range of stakeholders, presenting different regulatory challenges to those associated with centralised generalisation.<sup>91</sup> An example is the regulatory framework in Bangladesh, which an International Renewable Energy Agency (IRENA) report identifies as ‘at the forefront of the off-grid renewable energy transformation’, with ‘the world’s fastest growing off-grid electrification programme’.<sup>92</sup> Bangladesh manages its solar home system programme through a state-owned financial institution, IDCOL, which works with around 48 partner organisations, including micro-finance providers and NGOs.<sup>93</sup>

Legislating to promote renewable energy, including through renewable energy obligations, is shown by national experiences to be a complex undertaking that can address multiple policy imperatives. This includes climate change mitigation, but also energy poverty, energy security and industry development. Experience in some countries shows that monitoring or controlling the take-up of tariffs can be critical to the success of a scheme. Furthermore, renewable energy legislation does not exist in isolation. Its implementation can be affected by other regulatory choices and capabilities, such as a price on carbon (if any) and access to international support in the form of finance, technology and capacity building.

### ***Nuclear energy***

Regulatory environments for low-carbon nuclear energy are established in several states. Notably, however, this is no guarantee of nuclear energy being built or delivered. For example, Malaysia’s Atomic Energy Licensing Act 1984 establishes the Atomic Energy Licensing Board to regulate the atomic energy industry, including the establishment of nuclear power plants, treatment and disposal of waste, and standards on liability for nuclear damage. While a proposal exists to build two nuclear generators in Malaysia by 2021, there are currently none.

In relation to the lawfulness of nuclear power as a source of energy, a number of interesting legal initiatives exist in different Commonwealth countries. Few countries have banned the construction of nuclear energy installations or mandated the phase-out of existing installations.<sup>94</sup> Several Commonwealth countries are pursuing strategies

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<sup>90</sup> Law N° 2011/022 of 14 December 2011 Governing the Electricity Sector in Cameroon, s 59(2).

<sup>91</sup> UNFCCC Technology Executive Committee, ‘TEC Brief #8 – Facilitating technology deployment in distributed renewable electricity generation’ (November 2015) 6.

<sup>92</sup> International Renewable Energy Agency (IRENA), *IOREC 2014: Accelerating Off-Grid Renewable Energy, Key Findings and Recommendations* (IRENA, Abu Dhabi 2015) 10.

<sup>93</sup> *Ibid.*

<sup>94</sup> Despite its title, New Zealand’s Nuclear Free Zone, Disarmament, and Arms Control Act 1987 does not prohibit land-based nuclear power production. Similarly, section 140A of the Australian Environmental Protection and Biodiversity Conservation Act 1999 prohibits the minister of the environment from

to expand their nuclear power capacity in the context of existing or new legislation and regulation concerning nuclear power safety. For example, Pakistan (where nuclear power accounted for 4.4 per cent of electricity production in 2015) has three operational nuclear power reactors and two further reactors under construction.<sup>95</sup> The Pakistan Nuclear Regulatory Authority Ordinance 2001 establishes the PNRA as the national authority for the regulation of safety of nuclear installations, including those producing power, and the 2004 Regulations on Safety of Nuclear Power Plants Operation deal with the ‘safety aspects of management, commissioning, operation and decommissioning of nuclear power plants’.<sup>96</sup>

Also in South Asia, the Perspective Plan of Bangladesh: 2010-2021 and the Power System Master Plan 2010 include the installation of nuclear power capacity. Bangladesh promulgated the Bangladesh Atomic Energy Regulatory Act in 2012, and in 2013 established the Bangladesh Atomic Energy Regulatory Authority.<sup>97</sup> In the United Kingdom, there is a bespoke regime for licensing nuclear facilities<sup>98</sup> and a dedicated regulator, the Office of Nuclear Regulation.<sup>99</sup> Despite having existing nuclear power facilities, developing new nuclear facilities in the UK has resulted in a number of legal challenges.<sup>100</sup>

### **Energy efficiency laws**

Increasingly, many Commonwealth countries have developed national strategies to promote energy efficiency and associated measures. In terms of associated measures, regulatory approaches include: legally binding product design standards, information labelling regulations, and building regulations and building energy efficiency disclosure requirements that are aimed at reducing energy use. States have also created agencies charged with promoting energy efficiency standards.<sup>101</sup>

Some countries have overall energy efficiency strategies. Such strategies can be in the form of mandated policy-making powers, as adopted in India. The Indian Energy Conservation Act 2001, for example, established a Bureau of Energy Efficiency,<sup>102</sup> with a wide array of powers. The bureau may ‘recommend to the Central Government the

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approving a nuclear power plant; however, nuclear power plants do not currently require approval under that act.

<sup>95</sup> IAEA, Power Reactor Information System

<<https://www.iaea.org/PRIS/CountryStatistics/CountryDetails.aspx?current=PK>> accessed 2 March 2018.

<sup>96</sup> Pakistan, *Regulations on Safety of Nuclear Power Plants Operation* (PAK/913) (2004) s 3.

<sup>97</sup> Khondaker M Asaduzzaman and Mohammad Shawkat Akbar, ‘National Nuclear Power Programme of Bangladesh’, Technical Meeting on Topical Issues in the Development of Nuclear Power Infrastructure, 3–6 February 2015, Vienna, Austria; see also: Australia, Environment Protection and Biodiversity Conservation Act 1999 (Cth) s 22 and 140.

<sup>98</sup> United Kingdom, Nuclear Installations Act 1965; Nuclear Installations Regulations 1971 SI 1971/381.

<sup>99</sup> United Kingdom, Energy Act 2013, part 3.

<sup>100</sup> *R (Greenpeace) v SS for Trade and Industry* [2007] EWHC 311 (admin) (failure to consult the public adequately); *R (An Taisce) v SS for Energy and Climate Change* [2014] EWCA Civ 1111 (unsuccessful action claiming failure to conduct a lawful environmental impact assessment in relation to transboundary environmental impacts).

<sup>101</sup> An example is Mauritius’ Energy Efficiency Management Office, established by legislation to ‘promote the efficient use of energy’ and ‘promote national awareness for the efficient use of energy as a means to reduce carbon emissions and protect the environment’: Mauritius, Energy Efficiency Act 2011, s 5.

<sup>102</sup> India, Energy Conservation Act 2001, s 3(1).

norms for processes and energy consumption standards'<sup>103</sup> and 'take suitable steps to prescribe guidelines for energy conservation building codes'.<sup>104</sup> Other powers include promoting energy conservation research and development, formulating energy efficiency pilot projects, and promoting 'innovative financing of energy efficiency projects'. State governments are also given powers with respect to energy efficiency.<sup>105</sup> According to India's INDC, India's energy intensity declined by more than 2.5 per cent per annum from 2005 to 2012.<sup>106</sup>

Another strategic approach to energy efficiency is to aim for national energy efficiency targets - that is, national targets to reduce energy consumption. This approach is adopted in European Union member states, including the UK, Cyprus and Malta, which are required to set national energy efficiency targets in order to pursue an overall EU energy efficiency target of reducing energy consumption by 20 per cent by 2020, against a 2007 'business as usual' baseline.<sup>107</sup>

A range of specific energy efficiency strategies has also been adopted across Commonwealth countries. In relation to product design standards, for example, the Australian Greenhouse and Energy Minimum Standards Act 2012 sets nationally consistent minimum standards for electricity-consuming appliances such as refrigerators, air conditioners and chillers. Similarly, the United Kingdom is bound by European Union energy efficiency design requirements for a range of energy-related products, including computers, electric motors, domestic cooking appliances, televisions, air conditioners and heaters, and lighting products.<sup>108</sup> The EU also monitors a voluntary scheme for industries to sign agreements to reduce the energy consumption of their products.<sup>109</sup> A related approach is seen in India, where the Energy Conservation Act 2011 empowers the central government to prohibit sale or import of appliances that do not meet energy consumption standards.

Another approach to incentivising energy efficiency is through information disclosure. An example is to require the provision of energy efficiency information when property is sold or leased. This regulatory technique can apply to both residential property and commercial property transactions, and aims to internalise energy costs in market transactions and incentivise market behaviour that promotes energy efficiency. An example of the latter is seen in Australia's Federal Building Energy Efficiency Disclosure Act 2010, which applies when commercial office space of 2000m<sup>2</sup> or more is offered for sale or lease. Sellers and lessors of office space must obtain a Building Energy Efficiency

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<sup>103</sup> *Ibid*, s 13(2)(a).

<sup>104</sup> *Ibid*, s 13(2)(d). The Bureau of Energy Efficiency established the Energy Conservation Building Code in 2007.

<sup>105</sup> *Ibid*, ch 6.

<sup>106</sup> Government of India, INDC, 8  
<<http://www4.unfccc.int/submissions/INDC/Published%20Documents/India/1/INDIA%20INDC%20TO%20UNFCCC.pdf>> accessed 19 July 2016.

<sup>107</sup> Directive 2012/27/EU on energy efficiency [2012] OJ L315/15.

<sup>108</sup> Directive 2009/125/EC on eco-design legislation [2009] OJ L285/10.

<sup>109</sup> For the current set of voluntary agreements, see: <  
[https://ec.europa.eu/energy/sites/ener/files/documents/list\\_eco-design-voluntary\\_agreements.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/list_eco-design-voluntary_agreements.pdf)>  
accessed 2 March 2018.

Certificate when selling or leasing office space. Certificates provide the building's National Australian Built Environment Rating System Energy star rating.

In relation to building regulations more generally, one approach has been to assign ratings to buildings according to their energy efficiency and conservation performance. For example, Kenya's Energy Regulatory Commission, in consultation with the minister responsible for energy, designates buildings 'by types, quantities of energy use, or methods of energy utilisation for purposes of energy efficiency and conservation'.<sup>110</sup> Building owners are obliged to 'conserve energy, audit and analyse energy consumption', with criminal sanctions for failure to comply.<sup>111</sup> A different approach is for building regulations to require compliance with energy efficiency standards for any new building developments, or for any renovations of existing buildings. This is the approach in England and Wales, where energy efficiency requirements apply to any new building or an extension of any existing building.<sup>112</sup>

Energy efficiency requirements can also target heavily polluting installations, as in the case of the European Union Integrated Pollution Prevention Control regime, which sets 'best available techniques' as the required technical standard for the operation of heavily polluting industry and requires that 'energy is used efficiently'.<sup>113</sup>

A range of other legal and regulatory tools have also been employed to promote energy efficiency, with varying success. In the United Kingdom, the 'Green Deal', for example, was a scheme that aimed to ensure that householders would not have increased energy bills if they refitted their homes to improve energy efficiency.<sup>114</sup> However, the scheme was complex in its implementation in practice. The CRC Energy Efficiency Scheme was another scheme, now no longer active, which covered large, non-intensive organisations and required them to buy and surrender allowances to cover CO<sub>2</sub> emissions from gas and electricity use.

Overall, energy efficiency laws are an important part of a regulatory package in meeting climate mitigation goals, by reforming the demand side of energy systems, while also meeting other goals such as energy security. Enshrining energy efficiency measures in law holds governments and private sector actors to account in transforming energy use, building stocks, and production and consumption behaviours. A mix of strategic and associated measures can ensure a consistent approach to energy efficiency policy, although experience from the United Kingdom shows that complicated schemes can be difficult to implement.

### ***Taxation and social security law***

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<sup>110</sup> Kenya, Energy Act 2006 [Rev 2012], s 105(1).

<sup>111</sup> Kenya, Energy Act 2006 [Rev 2012], s 106.

<sup>112</sup> With some exceptions (such as listed buildings and small dwellings): Building Regulations 2010 SI 2010/2214, reg 21. Note these regulations partly implement the EU Directive 2002/91 on the energy performance of buildings [2002] OJ L1/65.

<sup>113</sup> Directive 2010/75/EU on industrial emissions [2010] OJ L334/17, art 11(f). See also Ghana's plan to '[d]ouble energy efficiency improvement to 20% in power plants' by scaling up 120 MSCF12 natural gas replacement of light crude oil for electricity generation in thermal plants, which will be supported by the National Natural Gas Master Plan: Republic of Ghana, 'Ghana's intended nationally determined contribution (INDC) and accompanying explanatory note' (September 2015) 12.

<sup>114</sup> For details, see <<https://www.gov.uk/green-deal-energy-saving-measures/overview>> accessed 19 July 2016.

Typically, tax policy is within the scope of central government competence, and is implemented through legislation. There are many ways in which the legal design of the tax and benefits systems could be used to incentivise climate mitigation and to reduce the hardship of climate change impacts.<sup>115</sup>

One avenue for using the taxation system to promote mitigation is to increase the cost - by imposing a tax - of activities that increase GHG emissions. One celebrated example was the Indian 'cess' (or tax) on the extraction or importation of raw coal, raw lignite and raw peat.<sup>116</sup> As originally conceived, the revenue raised was paid into the National Clean Energy and Environment Fund to be spent on projects promoting a clean environment. In its 2016-17 budget, the Indian government doubled the cess from 200 to 400 Rupees per tonne of coal, before fundamentally undermining the scheme in 2017 by diverting its revenues to consolidated revenue.<sup>117</sup>

Another example is the UK Climate Change Levy,<sup>118</sup> which imposes a tax on energy use by businesses in the industrial, commercial, agricultural or public service sectors.<sup>119</sup> The levy rates are set to encourage use of low-carbon technology for producing electricity. This tax can be reduced for energy intensive businesses that enter into Climate Change Agreements with the environmental regulator, committing to make energy efficiency improvements. It has been argued, however, that this particular combination of regulatory tools could undermine the efficacy of the tax and potentially work against innovation in business practice to reduce emissions.<sup>120</sup>

One way of simultaneously improving the cost-effectiveness of carbon pricing schemes and lessening their impacts on households and businesses is to use the revenue raised through the pricing scheme to fund cuts in other taxes (known as 'revenue recycling'). All taxes cause economic distortions. For example, personal and company income taxes cause distortions in labour and capital markets by reducing the returns from work and investment. By using the revenues raised through a carbon pricing system to cut income taxes, it is possible to lessen these distortions, thereby improving both economic and environmental outcomes. A further benefit is that the reductions in personal income taxes can lessen the household impacts of the carbon price.

An example of revenue recycling was in Australia's Carbon Pricing Mechanism, which ran from 2012 to 2014. The pricing mechanism was embodied in the Clean Energy Act 2011. Separately, the government made changes to personal income taxes, via the Commonwealth Income Tax Assessment Acts,<sup>121</sup> which raised the tax-free thresholds and adjusted low income tax offsets. The net effect of these changes was to ensure

<sup>115</sup> See, for example, Glibert Metcalf, 'An Equitable Tax Reform to Address Global Climate Change', Discussion Paper 2007-12 (The Hamilton Project, The Brookings Institution 2007).

<sup>116</sup> India, Clean Energy Cess Rules 2010, ss 2(h), 6(1).

<sup>117</sup> 'India diverts Rs 56,700 crore from the fight against climate change to Goods and Service Tax regime', Scroll In (24 July 2017) <<https://scroll.in/article/844528/india-diverts-rs-56700-crore-from-the-fight-against-climate-change-to-goods-and-service-tax-regime>> accessed 2 March 2017.

<sup>118</sup> United Kingdom, Climate Change Levy (General) Regulations 2001 SI 2001/838 (as amended).

<sup>119</sup> With exceptions for small energy users, domestic energy users and charities.

<sup>120</sup> Ralf Martin and Ulrich Wagner, 'Econometric Analysis of The Impact of the UK Climate Change Levy and Climate Change Agreements on firms' Fuels Use and Innovation Activity', OECD Report (2008) COM/ENV/EPOC/CTPA/CFA(2008)33/FINAL.

<sup>121</sup> Australia, Income Tax Assessment Act 1997 and Income Tax Assessment Act 1936.



that an individual could earn A\$20,500 before paying any net tax, almost A\$15,000 above previous levels. These changes were intended to lessen impacts on households and improve the cost-effectiveness of the carbon pricing policy.

### ***Laws relating to sequestration of GHG emissions***

One set of suggested policy responses to the problem of climate change involves geo-sequestration, or ‘carbon capture and storage’ (CCS). On this approach, rather than reducing GHG emissions, mitigation might be achieved through the long-term storage of GHG emissions deep underground, whether on land or in the deep seabed. The scientific risks and ethical merits of such strategies remain under debate.<sup>122</sup> As a result, geo-sequestration of GHG emissions raises many legal and regulatory concerns, relating primarily, but not solely, to environmental protection and public safety.

Geo-sequestration legal regimes established to date are largely prospective and to an extent speculative, in light of the fact that commercial applications of geo-sequestration techniques are yet to be fully established internationally.<sup>123</sup> The emerging nature of the technology involved means that CCS remains a costly intervention, beyond the commercial capacity of many businesses and countries.

The European Union Carbon Capture and Storage (CCS) Directive is an example of a comprehensive regime for regulating the ‘environmentally safe’ storage of CO<sub>2</sub>.<sup>124</sup> It requires operators of all sites where geological storage of CO<sub>2</sub> will be conducted to have a permit, and only those sites that meet certain environmental conditions can be selected for CO<sub>2</sub> storage in the first place. The directive also regulates the capture and transport aspects of CCS, as well as the aftercare of CCS sites. Operators are required to have sufficient financial resources to manage the site in the long term, including for managing any risks of leakage. The Directive has created this bespoke regime by amending other environmental regimes and co-ordinating the CCS regime with the EU ETS, showing how a complex array of environmental regulation must work together to allow CCS activity and manage its environmental risks. The Directive has, however, been criticised for creating a fully functioning regulatory regime before any working plants are in operation to test the regime.<sup>125</sup>

Another interesting legal dimension of carbon sequestration concerns the construction of sequestration opportunities in land as legally valuable rights. In New South Wales, for example, a carbon sequestration right is defined in the New South Wales Conveyancing Act 1919 as a right to the ‘legal, commercial or other benefit ... of carbon sequestration by any existing or future tree or forest on the land after 1990’.<sup>126</sup> Similar provisions are found in the property laws of other Australian states. In practical terms, the benefits of these provisions are contingent on the federal government mitigation

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<sup>122</sup> Leakage of stored CO<sub>2</sub> is a particular concern; see: British Geological Survey <<http://www.bgs.ac.uk/discoveringGeology/climateChange/CCS/willStoredCO2Leak.html>> accessed 2 March 2018.

<sup>123</sup> The first commercial-scale CCS plant commenced operation in October 2014 in Saskatchewan province, Canada.

<sup>124</sup> Directive 2009/31/EC on the geological storage of carbon dioxide [2009] OJ L140/111.

<sup>125</sup> Richard Macrory, ‘Carbon Capture and Storage’ in R Brownsword, E Scotford and K Yeung, *Oxford Handbook on Law, Regulation and Technology* (Oxford University Press 2017).

<sup>126</sup> New South Wales, Conveyancing Act 1919, s 87A. S 88AB deems this right to be a *profit à prendre* in property law terms.

framework, as this is where the demand for carbon sequestration is most likely to originate.

### ***Land use and infrastructure planning laws***

Land use planning has a critical role to play in climate change mitigation and adaptation. There are various ways in which climate change considerations may be taken into account in approving new developments and developing land use plans. These include as relevant considerations in routine planning decisions, as informing environmental impact assessments undertaken as part of the planning process, to determining policies for large-scale infrastructure planning.

Where planning laws are set up as ‘plan-led’ systems, in which development requires planning permission in accordance with government planning policy against a statutory backdrop of planning rules and procedures, much will depend on the content of the relevant planning policies, which may be amended frequently. Thus, for example, one of the main United Kingdom planning statutes was amended in 2008 to require that land use planning documents must, taken as a whole, ‘include policies designed to secure that the development and use of land in the local planning authority’s area contribute to the mitigation of, and adaptation to, climate change’.<sup>127</sup>

Planning systems can have varying approaches to mitigation and adaptation considerations. For example, under Australian planning laws, mitigation issues are generally only considered as part of the assessment and approval processes for large, emissions-intensive projects and, even then, it has been relatively rare for planning laws to be used as the primary instrument for reducing emissions. An exception to this is the assessment of renewable energy projects, where planning laws mandate or allow decision-makers to have regard to the environmental benefits associated with mitigation.<sup>128</sup>

By contrast, Australia’s planning laws are used more actively in relation to climate change adaptation, particularly to address coastal climate hazard and wildfire risks.<sup>129</sup> For example, most Australian states have sea-level rise planning benchmarks, which set anticipated levels of sea-level rise over the coming century and require planning authorities to make strategic and statutory planning decisions on the basis that these are likely to occur. In Victoria, for instance, clause 13 of the State Planning Policy Framework, a statutory instrument under the Victoria Planning and Environment Act 1987, requires planning authorities to ‘plan for and manage the potential coastal impacts of climate change’.<sup>130</sup> For these purposes, planning authorities are required to: ‘plan for possible sea-level rise of 0.8 metres by 2100, and allow for the combined

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<sup>127</sup> United Kingdom, Planning and Compulsory Purchase Act 2004, s 19 (introduced by the Planning Act 2008). This is applicable in England and Wales.

<sup>128</sup> See New South Wales, Environmental Planning and Assessment Act 1979; *Taralga Landscape Guardians Inc v Minister for Planning* [2007] NSWLEC 59; and *King & Anor v Minister for Planning; Parkesbourne-Mummel Landscape Guardians Inc v Minister for Planning; Gullen Range Wind Farm Pty Limited v Minister for Planning* [2010] NSWLEC 1102.

<sup>129</sup> A Macintosh, A Forester and J McDonald, *Limp, Leap or Learn? Developing Legal Frameworks for Climate Change Adaptation Planning in Australia* (National Climate Change Adaptation Research Facility, Gold Coast 2013).

<sup>130</sup> Victoria, Planning and Environment Act 1987, Clause 13.01-1.

effects of tides, storm surges, coastal processes and local conditions such as topography and geology when assessing risks and coastal impacts associated with climate change’.

The legal influence of climate change in the planning system also depends on how planning decisions, which are made by local authorities, planning inspectors or other authorised officials, are reviewed, if at all, by courts and tribunals. In reviewing planning decisions for their legality, one important factor concerning how climate change concerns are taken into account is whether there are environmental objectives or principles contained within planning legislation. An example of where such principles have had decisive roles to play in informing and reviewing planning decisions, including large infrastructure projects with potential climate change impacts, is in the case of the New South Wales Environmental and Planning Assessment Act 1979, the objectives of which include the promotion of ‘ecologically sustainable development’.<sup>131</sup>

Environmental impact assessment procedures are generally incorporated within the planning system, requiring environmental impacts to be considered before consent is given for particular projects. By its very nature, environmental impact assessment should take into account environmental risks generated by climate change, but much will depend on which particular projects are subject to impact assessment and the scope of required environmental impact assessment reports. An interesting legal development in both of these respects has been the revision of the European Union Environmental Impact Assessment Directive in 2014.<sup>132</sup> The revised Directive provides that projects with significant climate change impacts should be subject to impact assessment, and that climate impacts must be included within the scope of environmental impact assessment exercises. The assessment report must describe the ‘impact of the project on climate’, such as the nature and magnitude of greenhouse gas emissions, and the vulnerability of the project to climate change.

A subsequent issue is what decision-makers must do on the basis of such reports. Environmental impact assessment requires an assessment *procedure* rather than an outcome on the basis of that assessment. The weight of an environmental impact assessment report within a planning regime depends on the construction of the relevant statutory regime. The European Union regime is an interesting example in this respect, in so far as the recent revision of the directive specifies that environmental impact assessment reports should be ‘duly taken into account’ in relevant development consent procedures. It also provides that reasons should be given for the final decision that address the significant environmental impacts identified in the assessment process.<sup>133</sup>

While such ‘take into account’ provisions might, on the face of it, appear substantively weaker than obligations of outcome (that is, obligations that require substantive outcomes or standards to be met), they have an important legal role in constructing lawful decision-making. This is because decisions will not be legal unless the prescribed matters, such as ‘likely climate change impact’, are in fact taken into account in some demonstrable way. The strength of such provisions depends on their precise

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<sup>131</sup> New South Wales, Environmental and Planning Assessment Act 1979, s 5; see e.g. *Gray v Minister for Planning* [2006] NSWLEC 720. Note that most Australian states have equivalent provisions.

<sup>132</sup> Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment [2014] OJ L124/1, revised Annexes III and IV.

<sup>133</sup> *Ibid*, revised arts 8 and 8a.

construction, interpretation and oversight by courts. Nonetheless, such obligations can be powerful requirements in shaping decision-making connected to climate change causes and impacts.

In relation to large infrastructure projects, countries can have special planning regimes for such projects. The statutory construction of the planning regime will determine the extent to which the climate impacts of such projects are taken into account in the approval process.<sup>134</sup> Notably, climate change issues have emerged in some jurisdictions as contentious considerations in proposing or approving infrastructure development.<sup>135</sup>

It is entirely feasible for developing countries, including small island developing states, to have planning laws, building codes and land use laws that account for climate change impacts and disaster-risk reduction. However, national experiences disclose significant challenges of enforcement and the possibility of disconnections between climate change, land use and infrastructure planning, and disaster management.<sup>136</sup> For example, the experience in Bangladesh has been that: ‘[i]ntroducing a disaster and climate risk reduction culture and practice takes time; especially when replacing an embedded culture of emergency management and relief. Revising existing legal frameworks and changing the practice requires finding common ground and shifting mindsets’.<sup>137</sup>

### ***Water management law***

This section considers climate change adaptation strategies and how these have been included in water management law, if at all. This is relevant both to industry needs, but also to basic subsistence requirements for water.

A good example of legislative consideration of climate change adaptation in the context of water management is Zambia’s Water Resources Management Act 2011, which provides that ‘the management, development and utilisation of water resources shall take into account climate change adaptation’.<sup>138</sup> The act provides detailed guidance on how the Water Resources Management Authority is to ‘conserve, preserve and protect the environment ... and take into account climate change and the challenges posed by climate change’, including by ‘measuring, minimising and managing the impacts of climate change on water resources using effective adaptation approaches’, ‘applying environmental science, technology and information to guide and support proactive climate change planning and management’ and ‘ensuring extensive participation in interagency and intra-agency [sic] research planning related to climate change’.<sup>139</sup> The

<sup>134</sup> For example, the United Kingdom Planning Act 2008 requires ‘sustainability’ appraisals to be conducted for all ‘national policy statements’ that are issued by government to guide the development of major infrastructure in different sectors.

<sup>135</sup> See, for example, *R (on the application of the London Borough of Hillingdon and others) v Secretary of State for Transport* [2010] EWHC 626 (admin) (plans for a third runway at London’s Heathrow Airport found unlawful, partly for failing adequately to consider climate change impacts in line with the government’s developing climate change policy).

<sup>136</sup> The United Nations Office for Disaster Risk Reduction (UNISDR), ‘Progress and Challenges in Disaster Risk Reduction: A Contribution Towards the Development of Policy Indicators for the Post-2015 Framework on Disaster Risk Reduction’ (Geneva, Switzerland 2014) 124ff.

<sup>137</sup> *Ibid*, 4.

<sup>138</sup> Zambia, Water Resources Management Act 2011, s 6(q).

<sup>139</sup> *Ibid*, s 8(2)(b).

minister is obliged to ‘ensure that the Authority puts in place adaptive measures for climate change in collaboration with appropriate and conservancy authorities’.<sup>140</sup> Catchment councils and subcatchment councils are also given responsibilities concerning climate change.<sup>141</sup>

A different kind of legal requirement incorporating climate change adaptation into coastal management processes can be found in South Africa, in relation to determinations of the coastal boundary of a coastal protection zone. These determinations must take into account ‘the potential for the number and severity of natural disasters to increase due to the effects of global climate change and other impacts on the environment, and the importance of taking preventive measures to address these threats’.<sup>142</sup> This is another example of a requirement to ‘take matters into account’ when a public body is making a decision. As indicated above, such provisions can have significant roles in guiding decision-making if well drafted and supervised by courts.

### ***Forestry management law***

This section considers the extent to which relevant legislation incorporates climate change mitigation or impacts in relation to forestry management. An overarching approach to the incorporation of climate change concerns into forestry management can be found in Guyana law, which nominates ‘combating climate change’ as a purpose of its national protected areas system.<sup>143</sup> In the case of Guyana, there are seven types of protected areas, including a strict nature reserve and wilderness reserve.<sup>144</sup> Each type of protected area is subject to a particular regime of management.<sup>145</sup>

One important legal influence on national forestry management law in some countries is the UNFCCC ‘Reducing Emissions from Deforestation and Forest Degradation’ (REDD+) mechanism in the context of climate change. REDD+ projects aim to reduce emissions from deforestation and forest degradation, and to promote the conservation, sustainable management of forests and enhancement of forest carbon stocks, by creating financial incentives for the storage of carbon in forests.

With the development of a REDD+ international law framework<sup>146</sup> and private REDD+ compliance markets, member states with significant forest endowments have developed policies and regulation concerning REDD+ projects and other ‘Payments for Ecosystem Services’. In Rwanda, for example, legislation requires that the ‘sale of forestry services such as the carbon market and others shall be made in accordance with an agreement between the person seeking such a service and the Authority

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<sup>140</sup> *Ibid*, s 26(d).

<sup>141</sup> *Ibid*, ss 18(1)(k), 20(1)(i).

<sup>142</sup> South Africa, National Environmental Management: Integrated Coastal Management Act 2008, s 28(3)(d).

<sup>143</sup> This mandate is to ‘assist in combating climate change’ includes protection of existing forests, forest restoration and expansion, protection of marine ecosystems, and protection of freshwater ecosystems and important watersheds’ (Guyana, Protected Areas Act 2011, s 24(h)).

<sup>144</sup> Guyana, Protected Areas Act 2011, s 42.

<sup>145</sup> *Ibid*, pt VI.

<sup>146</sup> Confirmed in Paris Agreement, art 5.

[responsible for the management and development of forests]’.<sup>147</sup> Other important aspects of forestry management regimes implementing REDD+ are the development of mechanisms for ‘free, prior and informed consent’ of communities affected by REDD+ activities and systems for monitoring national forestry inventories. In their INDCs, several parties mention REDD+ mitigation activities.<sup>148</sup>

Papua New Guinea was one of the original UN-REDD ‘pilot’ countries. Early UN-REDD activities in Papua New Guinea focused on the development of stakeholder engagement, including through free, prior and informed consent guidelines.<sup>149</sup> A particular feature of Papua New Guinea has been that forestlands are subject to customary ownership,<sup>150</sup> potentially enabling REDD+ benefits to ‘directly’ accrue to forest communities.<sup>151</sup>

Papua New Guinea’s INDC states: ‘[t]he primary mitigation effort of Papua New Guinea lies in reducing emissions from land use change and forestry ... The main forestry effort will be co-ordinated through the existing REDD+ initiative’.<sup>152</sup> Papua New Guinea has established a REDD+ Directorate within the Office for Climate Change and Development for this purpose.<sup>153</sup> REDD+ policy in Papua New Guinea is constrained, to some extent, by a lack of data on forestry emissions and removals. The INDC cites current efforts to implement a national forest inventory and assessments of land use change, which is projected to produce data in ‘the next few years’ to enable REDD+ implementation.<sup>154</sup> These efforts are complicated by challenges in setting baselines for REDD+ schemes, as REDD emissions are variable, causal drivers of emissions are complex, and forecasting emissions trends is an imprecise science. A further complication is that national, provincial and local governments often face significant resource constraints that inhibit their ability to enforce customary property rights and environment and natural resource laws.<sup>155</sup>

### ***Transport regulation***

A variety of regulatory tools, such as low-emissions zones, CO<sub>2</sub> emissions targets for cars, public procurement rules and congestion charging, focus on reducing GHG emissions from the transport sector.

A common regulatory approach is to set design standards for cars and content requirements for fuels. The European Union has been proactive in this regulatory area, introducing and recently strengthening GHG emissions standards for passenger cars and

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<sup>147</sup> Rwanda, LAW No47bis/2013 OF 28/06/2013 Determining the Management and Utilisation of Forests in Rwanda, s 63.

<sup>148</sup> UNFCCC, ‘INDCs Synthesis Report’ (Oct 2015) paras 127, 156.

<sup>149</sup> UN-REDD Programme, < <http://www.un-redd.org/> > accessed 2 March 2018.

<sup>150</sup> 97 per cent of land in PNG is held under customary title.

<sup>151</sup> David Melick, ‘Credibility of REDD and Experiences from Papua New Guinea’ (2010) 24(2) *Conservation Biology*, 359.

<sup>152</sup> Papua New Guinea, ‘Intended Nationally Determined Contribution (INDC) under the United Nations Framework Convention on Climate Change’.

<sup>153</sup> *Ibid*, 6.

<sup>154</sup> *Ibid*, 4.

<sup>155</sup> The 2014 UNDP *National Human Development Report* states that, although a rigorous environmental regulatory regime is in place, ‘enforcement [is a] major issue’.

vans.<sup>156</sup> EU regulations also set fuel content requirements that reduce the GHG intensity of fuels over time,<sup>157</sup> and require labelling of new cars with information about their CO<sub>2</sub> emissions and fuel efficiency for consumers.<sup>158</sup>

A different regulatory approach to limiting GHG emissions from heavily polluting motor vehicles is seen in Ghana's prohibition and penalty on the importation of vehicles aged ten years or over, which is designed to discourage 'over-aged vehicles' from being imported.<sup>159</sup>

Other forms of transport regulation work on a more systemic basis, controlling traffic flows overall, rather than individual vehicles. Examples include congestion charging and low-emissions zones to reduce the volume of traffic on the streets,<sup>160</sup> and high-emitting vehicles in particular.

### ***Subsidy regulation***

This section considers examples of legal or regulatory requirements that facilitate or limit subsidies for fossil fuel or renewable energy sectors in particular. Fossil fuel subsidies make a significant contribution to greenhouse gas emissions, with the International Energy Agency reporting that 13 per cent of global CO<sub>2</sub> emissions come from 'subsidised fossil-fuel use'.<sup>161</sup> By contrast, measures taken by governments to support climate mitigation, to incentivise renewable energy production in particular, can in some cases be construed as unlawful subsidies under international economic law.

In 2012, Ghana began removing subsidies on petroleum products and electricity, to be followed by the introduction of an automatic prices adjustment system.<sup>162</sup> An automatic utility and petroleum price formulae provides for the 'phasing-out of subsidies on utility and petroleum products'.<sup>163</sup> As indicated above, Ghana's *Renewable Energy Act 2011* established a feed-in-tariff scheme, consisting of a renewable energy purchase obligation, a feed-in-tariff rate and a connection to transmission and distribution systems.<sup>164</sup> The act also established a Renewable Energy Fund to finance the promotion of renewables, primarily through provision of financial incentives and subsidies.<sup>165</sup>

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<sup>156</sup> Regulation 333/2014/EU amending Regulation (EC) No. 443/2009 to define the modalities for reaching the 2020 target to reduce CO<sub>2</sub> emissions from new passenger cars [2014] OJ L103/15. There is similar legislation for light commercial vehicles.

<sup>157</sup> Directive 2009/30/EC amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions [2009] OJ L140/88.

<sup>158</sup> Directive 1999/94/EC relating to the availability of consumer information on fuel economy and CO<sub>2</sub> emissions in respect of the marketing of new passenger cars [1999] OJ L12/16.

<sup>159</sup> Ghana, Customs, Excise and Preventive Service (Management) Act 1993 (PNDCL 330) s 90.

<sup>160</sup> In the UK, London has both these schemes in operation. See: Transport for London <<https://tfl.gov.uk/modes/driving/low-emission-zone>> and <<https://tfl.gov.uk/modes/driving/congestion-charge>> accessed 2 March 2016.

<sup>161</sup> Energy and Climate Change, *World Energy Outlook Special Report* (OECD/IEA 2015) 71.

<sup>162</sup> Republic of Ghana, *Ghana's Third National Communication Report to the UNFCCC* (2015) 3.

<sup>163</sup> *Ibid*, 11.

<sup>164</sup> Ghana, *Renewable Energy Act 2011*, ss 25–30.

<sup>165</sup> *Ibid*, ss 31–32.

Distribution companies and bulk customers that breach the feed-in-tariff purchase obligation must pay into the Renewable Energy Fund.<sup>166</sup>

Such state-directed financial support for renewable energy can also act as a form of subsidy that needs to be justified under the rules of the World Trade Organization. As indicated above,<sup>167</sup> there have been two high-profile WTO disputes in recent years concerning domestic schemes to promote renewable energy, involving ‘domestic content requirements’ (DCRs) attached to renewables obligations. In the more recent case, *India-Solar Cells*,<sup>168</sup> the relevant Indian renewables obligation contained a DCR requiring energy suppliers to supply energy from solar cells produced in India. This was found to be an unlawful ‘trade-related investment measure’ under the WTO Agreement on Trade-Related Investment Measures (TRIMs), which breached the principle of national treatment in article III of the General Agreement on Tariffs and Trade.

The other case, *Japan/EU-Canada-Renewable Energy/FIT*, concerned a Canadian feed-in-tariff scheme with a DCR requiring solar and wind energy producers to source specified components in Ontario to be eligible for the scheme. As in *India-Solar Cells*, the WTO panel found that the programme was inconsistent with both article III(4) of GATT 1994 and with article 2(1) of the TRIMs Agreement due to its DCR requirement.<sup>169</sup> However, a more difficult issue was whether an unlawful subsidy had been conferred under the WTO Agreement on Subsidies and Countervailing Measures.<sup>170</sup>

On appeal,<sup>171</sup> the Appellate Body found that a government mandate to create an energy market with a certain proportion of renewable energy is not ‘in and of itself considered as conferring a benefit’ on renewable energy producers that might constitute an unlawful subsidy.<sup>172</sup> Whether the feed-in-tariff scheme at issue in fact conferred a benefit that might amount to a subsidy required a market analysis of whether the remuneration obtained by feed-in-tariff generators conferred on them an advantage compared with the remuneration they would otherwise have obtained in the marketplace. In constructing a methodology for this analysis, the parameters of the hypothetical marketplace would need to take into account the energy-supply mix designed by the Canadian state government. This shows the level of regulatory complexity involved in designing a feed-in-tariff scheme that complies with international economic law.

### **Corporate law**

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<sup>166</sup> Lom Ahlijah, ‘Energised thinking: Ghana’s renewable energy regime’, *King & Wood Mallesons* (21 November 2013) <<http://www.kwm.com/en/uk/knowledge/insights/energised-thinking-ghanas-renewable-energy-regime-20131121>> accessed 2 March 2018.

<sup>167</sup> See Part II above (discussion of WTO law).

<sup>168</sup> *India – Certain Measures Relating to Solar Cells and Solar Modules Panel Report* WT/DS456/R (24 February 2016, under appeal).

<sup>169</sup> This was supported by the WTO Appellate Body on appeal: see n 41.

<sup>170</sup> The WTO panel decision below found that there was no unlawful subsidy, as there was relevant ‘benefit’ conferred by the FiT scheme in the context of energy markets that do not operate competitively to attract investment for new sources of energy and which are heavily regulated by the state; however, this was overturned on appeal (*ibid*).

<sup>171</sup> See n 41.

<sup>172</sup> Under the SCM Agreement, a subsidy must include three basic elements: (i) a financial contribution, (ii) by a government or any public body within the territory of a member, (iii) which confers a benefit.



Increasingly, attention is being paid to the important role of corporate actors in taking into account climate change mitigation or impacts in corporate governance. There is a growing recognition that corporations, particularly large multinational corporations and private finance actors,<sup>173</sup> will have a significant impact on achieving climate change policy goals. Legal obligations can be part of incentivising private enterprises to act in a way that promotes climate change mitigation or adaptation.

A prominent example of such a legal obligation is found in the United Kingdom Companies Act 2006, which since 2013 requires all UK-incorporated quoted companies (that is, those with equity shares listed on the London Stock Exchange, New York Stock Exchange or NASDAQ, or EEA (European Economic Area) regulated) to report their GHG emissions in their directors' reports.<sup>174</sup> The aim of this measure is to allow investors to understand the climate risks of listed companies, to increase reporting of GHG emissions by individual firms, and to encourage the corporate sector to take climate change policy seriously at the level of individual businesses. In addition, where legal frameworks provide for fiduciary duties owed by directors to shareholders in a company, such as in the case of the UK Companies Act 2006, economic actors may be increasingly liable for their failures to anticipate and adapt to physical risks posed by climate change.<sup>175</sup>

A more indirect example of corporate regulation for climate policy is seen in India, where the Companies Act 2013 requires large companies (defined according to a certain level of profits) to spend 2 per cent of their annual profit on corporate social responsibility activities. Officially cited estimates indicate that a share of this corporate social responsibility funding of about 220 billion Indian rupees (INR; US\$3.5 billion) annually will be invested in environment initiatives.<sup>176</sup>

### **Financial law**

At least two aspects of financial law are relevant to climate change mitigation and adaptation: the establishment and regulation of national funds to promote investment in programmes and projects that promote climate policy; and mechanisms for regulating national receipts of climate finance and facilitating access to finance to assist with climate change impacts.

The United Kingdom Enterprise and Regulatory Reform Act 2013 established the world's first operational Green Investment Bank (GIB).<sup>177</sup> The bank was established as a limited company that is wholly owned by the UK government, with two overall objects: (1) to engage only in activities that 'involve, or are incidental or conducive to' making or encouraging investments that are likely to further one or more of the act's 'green

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<sup>173</sup> See Megan Bowman, *Banking on Climate Change: How Finance Actors and Transnational Regimes are Responding* (Kluwer International 2015).

<sup>174</sup> United Kingdom, The Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013 SI 2013/1970.

<sup>175</sup> See, for example, University of Oxford, Stranded Assets Programme, 'Summary of Proceedings, Environment-Related Risks and the Future of Prudential Regulation and Financial Conduct', 4th Stranded Assets Forum, Waddesdon Manor, 23 October 2015.

<sup>176</sup> India's Intended Nationally Determined Contribution (2015) 18.

<sup>177</sup> Analogous examples exist in other countries, e.g. Greenhouse Gas Technology Investment Fund Act (Canada, enacted 2005, not in force).

purposes'<sup>178</sup> (whether in the United Kingdom or elsewhere); and (2) to make or encourage investments that are likely to contribute to a reduction of global greenhouse gas emissions. In 2017, the GIB was sold to Australian investment bank Macquarie.<sup>179</sup> The renamed Green Investment Group retains its green purposes through the creation of a 'special share' in the bank that is held by independent trustees, ensuring that its green purposes could only be amended with the agreement of the independent special shareholder.<sup>180</sup>

Commonwealth member countries that are especially vulnerable to the impacts of climate change commonly need finance in order to move towards low-carbon, climate resilient economies. The Commonwealth Secretariat provides support to small Commonwealth countries and least developed countries in accessing specialised international climate funds, such as the Green Climate Fund (GCF), Adaptation Fund and Special Climate Change Fund (SCCF), through the Commonwealth Climate Finance Access Hub.<sup>181</sup> Countries making use of international finance require legal frameworks for the effective receipt, management and use of climate funds. Tuvalu's recent Climate Change and Disaster Survival Fund Act 2015 provides an interesting case study of a national mechanism established to regulate and protect international climate assistance.

**Box 6 Funding climate change adaptation: Climate Change and Disaster Survival Fund Act 2015 (Tuvalu)**

The Tuvalu Climate Change and Disaster Survival Fund Act 2015 establishes the Tuvalu Climate Change and Survival Fund to support responses to natural disasters and to help facilitate adaptation to climate change. The fund has two purposes: (a) to provide immediate vital services to the people of Tuvalu in combating the devastating impact of climate change and natural disasters; and (b) to allow the government and the people of Tuvalu to respond to future climate change impacts and natural disasters in a co-ordinated, effective and timely manner.<sup>182</sup> Tuvaluans affected by the impacts of climate change and natural disasters gain access to the fund through the submission of 'Requests for Assistance'. These requests are assessed by the Climate Change and Disaster Survival Fund Committee, which prepares assessment reports on the requests for approval by the Climate Change and Disaster Survival Fund Board. The board can approve or reject the committee's recommendations. If it rejects them, it is required to provide written reasons for doing so within seven days.

<sup>178</sup> The 'green purposes' are defined in s 1 as: (a) the reduction of greenhouse gas emissions; (b) the advancement of efficiency in the use of natural resources; (c) the protection or enhancement of the natural environment; (d) the protection or enhancement of biodiversity; (e) the promotion of environmental sustainability.

<sup>179</sup> Andrew Ward, 'Macquarie completes £2.3bn Green Investment Bank deal', Financial Times, 18 August 2017, <https://www.ft.com/content/e018d83a-835f-11e7-a4ce-15b2513cb3ff> (accessed 2 March 2018).

<sup>180</sup> <http://greeninvestmentgroup.com/about-us/privatisation-process/> (accessed 2 March 2018).

<sup>181</sup> Commonwealth Secretariat, 'New hub to help small states access millions for climate change' (28 November 2015) <<http://thecommonwealth.org/media/news/new-hub-help-small-states-access-millions-climate-change>> accessed 2 March 2018.

<sup>182</sup> S 7.

As this process suggests, the governance structure of the fund consists of the board and committee. The board comprises the minister for finance and economic development, general secretary of Tuvalu Red Cross and permanent secretary for the ministry of home affairs. The board has ultimate responsibility for the administration of the fund. The committee, which has nine members who are appointed on the basis of their occupancy of specified offices (e.g. secretary to government, attorney-general, director of public works department, director of health), is responsible for assessing applications for assistance and providing assessment reports to the board.

The fund must be established as a trust account in the National Bank of Tuvalu, with the board serving as the trustees. The Tuvaluan government is required to contribute A\$5 million to the fund. All donations to assist Tuvalu in its recovery from Tropical Cyclone Pam, including any funding from the Global Environmental Facility (GEF), Adaptation Fund and Green Climate Fund (GCF), are also required to be deposited in the fund. The statute specifies that ‘the fund may be augmented by grants through multilateral environmental agreements, bilateral contributions, and donations from foreign governments, foreign organisations, Tuvaluan communities and other individual donations’ and that the balance of the fund ‘shall not revert to the general account’.

The board is required to submit an annual report to cabinet on the utilisation of the fund. It is also required to submit financial accounts to the auditor-general every six months, who is then required to prepare a report on the management of the fund for parliament. An interesting aspect of the statute is that it contains a broad liability exemption, which provides that ‘No civil or criminal action shall lie against the minister or any person appointed pursuant to this Act with respect to anything done or omitted to be done by him in pursuance or intended pursuance of the powers or functions conferred on him under this Act unless he has acted, or omitted to act, in bad faith and without reasonable cause’.

#### IV. National laws and climate change: Indirect legal intersections

Having considered the myriad ways in which climate change impacts and causes are directly engaged or implicated by different bodies of law within a legal system, this Part considers areas of law that intersect *indirectly* with climate change. These are areas of law that are not primarily concerned with implementing climate change policy, or which do not explicitly take into account aspects of climate change. However, they still have the capacity to significantly affect GHG mitigation and climate change adaptation outcomes through their operation, including by providing ‘co-benefits’ in terms of climate change policy. As such, they are relevant and necessary to consider in evaluating how legal systems implicate, support and affect national climate change policy.

##### *Air quality law*

There are obvious co-benefits for climate change mitigation policy where existing regulatory control for air quality also covers GHGs, or regulates air pollution in such a way that minimises emissions of gases that are precursors to GHGs.

One direct overlap of air quality law and greenhouse gas mitigation is in relation to tropospheric ozone. Tropospheric, or ground-level, ozone is an atmospheric gas created by chemical reactions between nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds - both types of air pollutants - in the presence of sunlight. Ozone is both a local air quality pollutant and a GHG. In the United Kingdom, two main legal controls regulating air quality exist in relation to levels of ground-level ozone, both deriving from European Union air quality law.<sup>183</sup>

The EU Directive on ambient air quality sets environmental quality standards and measurement obligations in relation to ground-level ozone, with requirements to draw up air quality plans and take emergency measures if specified concentrations of ground-level ozone are exceeded.<sup>184</sup> The EU National Emissions Reductions Directive is a different kind of measure, setting upper limits for each EU member state for the total emissions of the four pollutants responsible for ground-level ozone pollution, acidification and eutrophication (sulphur dioxide, NO<sub>x</sub>, volatile organic compounds, and ammonia), requiring reductions in total national emissions over time.<sup>185</sup> This Directive thus regulates the gases that cause ozone as a harmful pollutant for human health, while also providing co-benefits in limiting GHGs.<sup>186</sup>

### ***Stratospheric ozone protection law***

The scientific relationship between the stratospheric ozone layer and the global climate is complex. It is suggested that positive efforts to reverse depletion of the ozone layer, particularly due to the implementation of the 1987 Montreal Protocol on reducing Ozone Depleting Substances, have led to anthropogenic emissions of substitute chemicals, which, while not directly harmful for the ozone layer, may contribute to global warming as GHGs.<sup>187</sup> As a result, laws that protect the ozone layer and climate change policies on GHG mitigation can overlap in some respects.

A good example of national ozone layer protection laws that provide and pursue co-benefits for controlling GHG emissions is found in Australian federal legislation. A set of Australian statutes establishes a regulatory regime for the management of ozone and synthetic greenhouse gases. Originally introduced to implement Australia's obligations under the Montreal Protocol, their scope has been broadened to include synthetic greenhouse gases (sulphur hexafluoride [SF<sub>6</sub>], perfluorocarbons [PFCs] and hydrofluorocarbons [HFCs]), a number of which are used in tandem with, or as substitutes for, ozone-depleting substances (including chlorofluorocarbons [CFCs], carbon tetrachloride [CCl<sub>4</sub>], methyl chloroform [CH<sub>3</sub>CCl<sub>3</sub>] and hydrochlorofluorocarbons

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<sup>183</sup> And ultimately deriving from Protocols to the Convention on Long-Range Transboundary Air Pollution.

<sup>184</sup> Directive 2008/50/EC on ambient air quality and cleaner air for Europe [2008] OJ L152/1.

<sup>185</sup> Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants [2016] OJ L334/1.

<sup>186</sup> Co-benefits are also through the regulation of fine particulate matter as an air pollutant, which includes and prioritises black carbon as an air pollutant and GHG.

<sup>187</sup> WMO and UNEP, 'Assessment for Decision-Makers - Scientific Assessment of Ozone Depletion: 2014', (10 September 2014): < [http://www.wmo.int/pages/prog/arep/gaw/ozone\\_2014/ozone\\_asst\\_report.html](http://www.wmo.int/pages/prog/arep/gaw/ozone_2014/ozone_asst_report.html) > accessed 2 March 2018.

[HFCs]).<sup>188</sup> HFCs, PFCs and SF<sub>6</sub> are all powerful GHGs, meaning that this regulation now effectively contributes to climate mitigation.

### ***Waste regulation***

Waste regulation that discourages landfill of waste has a significant climate mitigation co-benefit of reducing methane emissions from landfill. There are many examples of national waste laws that pursue this objective in different ways.

Commonwealth member countries that are part of the European Union, for example, are bound by legal requirements to reduce the amount of biodegradable municipal waste placed in landfill by certain target dates.<sup>189</sup> More generally, in waste policy, EU states are bound by the ‘waste hierarchy’, which requires that all national waste policy and legislation in EU member states complies with a priority order of options for waste, with disposal being the last resort. Through the waste hierarchy, member states are legally required to prioritise waste prevention, recycling and recovery, including energy recovery from waste where it meets a high enough energy efficiency threshold, above landfill.<sup>190</sup>

In less developed countries, waste management is a significant challenge due to the resource constraints faced by national, provincial and local governments, and low levels of public awareness about waste risks and responses. For example, in Papua New Guinea, the capital city, Port Moresby, with a population of approximately 400,000, has only one official waste disposal site, no effective separation of waste streams and limited recycling.<sup>191</sup> The landfill site consists of several decades of piled waste in a narrow valley, and lacks modern waste management systems. The government of Papua New Guinea, in collaboration with international partners, is taking steps to improve waste management services and systems in Port Moresby and other cities. In addition to resource constraints, one of the other potential obstacles to the improvement of waste services is the absence of a comprehensive legal and policy structure for waste management.<sup>192</sup>

### ***Vegetation management law***

Vegetation management law can cover a range of areas, including discouraging land clearing or forest harvesting, with a view to promoting biodiversity, preventing soil erosion and/or pursuing economic goals. The co-benefits of such measures for climate mitigation policy can be significant.

In Australia, for example, laws in all Australian states and territories regulate deforestation, known in Australia as ‘land clearing’. The two most important of these

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<sup>188</sup> Australia, Ozone Protection and Synthetic Greenhouse Gas Management Act 1989, Ozone Protection and Synthetic Greenhouse Gas (Import Levy) Act 1995, and Ozone Protection and Synthetic Greenhouse Gas (Manufacture Levy) Act 1995. There are mirror statutes at state level as well.

<sup>189</sup> Directive 1999/31/EC on the landfill of waste [1999] OJ L182/1, art 5.

<sup>190</sup> Directive 2008/98/EC on waste [2008] OJ L312/3, art 4. Note the exceptions to the order of the waste hierarchy in article 4(2) allowing deviation from the hierarchy, particularly where the ‘best overall environmental outcome’ justifies this.

<sup>191</sup> Asian Development Bank, *Solid Waste Management in the Pacific: Papua New Guinea Country Snapshot* (Asian Development Bank 2014).

<sup>192</sup> *Ibid.*

are Queensland's Vegetation Management Act 1999 and New South Wales' Native Vegetation Act 2003. These statutes intersect with other state legislation, such as the New South Wales Environmental Planning & Assessment Act 1979, which requires development consent and possibly environmental impact assessment for new land clearing projects, as well as the federal Environmental Protection and Biodiversity Conservation Act 1999. Such laws have been subject to legal challenge, however, including in a case in which a farmer sued the government for depriving him of his property rights by preventing him from clearing vegetation on this land.<sup>193</sup>

A further example is the Malaysian Land Conservation Act 1960, which establishes a regulatory regime to prevent soil erosion on 'hill land'. The legislation allows land to be declared hill land, after which restrictions apply to the use of the land. Such land may not be used for cultivation and no vegetation is allowed to be cleared, other than in accordance with an approval issued by the government land administrator.

### **Migration laws**

An area of national law where considerable pressure is expected in the future relates to the accommodation of persons displaced by climate change impacts under migration laws. Many more people are now displaced by disasters than by conflict.<sup>194</sup> There is, however, no international framework relating to people who move internationally or internally in relation to climate change. The Paris Agreement acknowledges that when taking action to address climate change, parties should respect, promote and consider their respective obligations regarding, among others, migrants.<sup>195</sup> To date, however, there are no known examples of the issue of climate change migration being reflected in national laws. In principle, there are two possible ways in which migration laws could accommodate climate change migrants: as climate change 'refugees', or through resettlement programmes on humanitarian grounds or otherwise.

The issue of legal asylum for persons displaced by climate change or environmental disasters is a relatively novel one. The New Zealand Immigration and Protection Tribunal is one of the very few to have considered whether persons seeking asylum as refugees could do so on the basis of climate displacement. The cases so far considered by the tribunal show the difficulty of characterising a person who is displaced by environmental disaster or degradation as being 'persecuted' within the requirements of the 1951 Refugee Convention.<sup>196</sup> One case in particular, *AF (Kiribati)*,<sup>197</sup> demonstrates not only the real legal difficulty, but also indicates how climate degradation might lead to successful refugee claims in some cases, particularly in the case of climate change-related disaster events. For states that are parties to the Refugee Convention, such evolving case law is important in informing how existing refugee laws might apply in a climate change context.

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<sup>193</sup> *Spencer v The Commonwealth* [2010] HCA 28.

<sup>194</sup> Internal Displacement Monitoring Centre, 'Global Estimates 2015: People Displaced by Disasters' (2015) <<http://www.internal-displacement.org/library/publications/2015/global-estimates-2015-people-displaced-by-disasters/>> accessed 2 March 2018.

<sup>195</sup> Paris Agreement, Preamble.

<sup>196</sup> See Jane McAdam, 'Jurisprudence on Climate Change, Disasters and Displacement' (2015) 3(1) *Migration Studies* 131.

<sup>197</sup> *AF (Kiribati)* [2013] NZIPT 800413.

As for resettlement programmes for climate change migrants, or migrants otherwise displaced by environmental degradation, this is likely to represent the most realistic route for legal migration in most cases. Such an approach relies largely on the discretion of governments, and can be impacted by human rights considerations. Some states are already considering resettlement programmes in light of deteriorating environmental conditions, although to date these mainly consist of internal resettlement.

## V. Conclusions and recommendations

### *Conclusions*

Appropriate legal and regulatory provisions are important in responding to climate change in all national legal systems, including Commonwealth member countries. Legal frameworks are important not only in implementing national strategies to mitigate climate change, but also in promoting resilience to climate change and in creating and enhancing enabling environments for the provision of international support concerning climate change, including addressing barriers to international support.

This paper has surveyed climate change laws in a number of Commonwealth countries, with varying demographics, geographies, levels of economic development, industrial and agricultural activity, vulnerability to climate change, and governance systems. These countries have responded to climate change in a range of ways, depending significantly on a range of contextual factors. For example, countries that are particularly vulnerable to climate change impacts and are less developed, such as Tuvalu, have strong laws on receiving climate change finance and financing disaster relief. Countries that have historically high emissions and a strong culture of legislating for environmental matters tend to have more detailed mitigation laws, such as the United Kingdom, with its framework climate change statute, statutory energy market reform, and range of energy efficiency measures.

Despite contextual differences, there are lessons that can be learned from the experience of countries to date in introducing climate change measures. In the first place, such experience highlights the value of legal responses to climate change in a national context, rather than the development of policy responses alone. Second, the review conducted highlights the range of possible legal measures that might be considered, covering regulatory domains that intersect both directly and indirectly with climate change policy. Finally, examples of best practice, and challenges when it comes to implementation, are useful lessons learned for the introduction of new legal and regulatory options.

Developing climate change measures in legal form has distinct advantages. Climate change is a long-term problem, with medium- to long-term goals now enshrined in international law. National responses need to be developed over similar timeframes. This implies establishing certain and predictable regulatory frameworks for all actors, including industry, state institutions, non-governmental organisations, and the public, who represent a range of stakeholders in climate issues and often make considerable investments, financial or otherwise. Embedding climate measures in law provides greater regulatory certainty, as legal measures are less vulnerable to repeal or marginalisation - although much depends on the format and strength of institutions that administer and oversee legal measures, as well as political considerations in the promulgation and repeal of national laws.

Within a context of increasing international climate co-operation, the importance of robust national legal frameworks concerning climate change goes beyond their immediate, local effects. For developing countries, and particularly for least developed countries and small island developing states, the existence of appropriate laws may facilitate the attraction of international support in the form of climate finance, technology transfer and capacity-building. The elaboration of climate laws and the provision of international assistance may thereby function as a virtuous cycle.

As to the range of measures that might be introduced to implement climate change policies on either mitigation or adaptation directly, a majority of Commonwealth member countries have not introduced a single, comprehensive 'climate law', instead preferring to address climate considerations through an array of national laws and regulations. Such laws and regulations cover a wide range of legal areas, from laws on energy market reform and incentivising renewable energy, to laws concerning the reporting, publicising and trading of emissions, planning, forestry/water management, and corporate governance laws. There are also areas of law that indirectly intersect with climate change, such as air quality law, vegetation management, and migration law. This latter group are areas of law that might have implications for the causes and effects of climate change, although they do not currently explicitly refer to or require the consideration of climate change issues.

This wide range of climate change laws indicates that it is important for Commonwealth member countries, like all countries generally, to consider how climate change mitigation and adaptation policies can be incorporated in all of their laws that intersect with climate change, directly or indirectly. Legally responding to climate change is a multifaceted task within a legal system, which may be facilitated by overarching climate change obligations being enshrined in law, but which requires a range of supporting and informed legal responses over a wide range of legal and regulatory areas.

As for best practice examples of climate change laws, it is clear from the diverse contexts considered in this paper that there is no one single best practice. However, some notable features of the legal measures highlighted in this paper include:

- clear legal structures that provide legal certainty to facilitate investments in long-term mitigation-related technologies, including overarching framework climate change laws that mandate long-term mitigation targets and plans, renewable energy obligations, and putting a price on carbon through regulation;
- developing energy market reform in a lasting, holistic way through establishing new legal frameworks for energy markets alongside the introduction of renewable energy sources;
- monitoring or controlling the take-up of tariffs in legal feed-in-tariff schemes for renewable energy;
- the political independence of expert climate change committees that perform technical tasks;
- adopting strategic approaches to energy efficiency through law;
- embedding public rights of access to information on GHG emissions;
- ensuring climate change impacts and adaptation measures are embedded in land-use planning regimes, providing certainty for investment and protection of the public interest; and



- transforming corporate governance through GHG reporting requirements.

As well as these examples of good practice, some climate change measures considered in this paper have encountered implementation challenges. A notable example is the EU-ETS and the challenges encountered in its early phases of operation, which have largely been addressed through legislative reform in the third phase of the ETS. Another significant legal barrier to implementing climate laws relates to the role of international economic law in limiting the unilateral actions of states to promote national industries, particularly renewable energy industries. Similar limits of supranational economic law, including competition law, operate in the European Union context. In addition, legal culture plays an important role in implementing legal change. In this respect, there are important lessons learned to date in the implementation of the REDD+ mechanism, as well as features of national and local planning systems that can militate against incorporating climate change considerations.

Finally, national experience to date indicates that the effectiveness of climate change laws rests in part on their responsiveness to changing national circumstances and international frameworks. Legislative review and amendments, including the introduction of up-to-date subordinate regulation, are important tools in this regard.

In sum, the legal task of analysing and responding to climate change is a highly complex one for national lawmakers and all legal specialists. Nonetheless, it is a vital exercise in evaluating how national legal systems implement and support national climate policies, particularly in determining compliance with national commitments under the Paris Agreement.

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