

FISHING FROM THE SAME POOL: THE INFLUENCE OF ENVIRONMENTAL GOVERNANCE ON LOCAL CLIMATE CHANGE ACTIONS IN SCOTLAND AND THE US PACIFIC NORTHWEST

ANTHONY JACKSON*, BARBARA ILLSLEY
and WILLIAM LYNCH

University of Dundee, Dundee, Scotland

**a.a.jackson@dundee.ac.uk*

Received 1 June 2011

Revised 1 December 2011

Accepted 12 December 2011

The impact of environmental governance on the delivery of local climate change plans is examined by comparing two transatlantic sub-national jurisdictions which have adopted stringent targets for reducing greenhouse gas emissions: Scotland and the Pacific Northwest region of the United States of America. The former relies on dirigiste top-down environmental governance, through which central government sets targets and imposes statutory duties that apply equally to all local councils. In the latter, a bottom-up multi-level form of environmental governance has emerged to compensate for the absence of a federal mandate. Specific action plans from a climate change pioneer in each location are assessed to test the strengths and limitations of these alternative modes of environmental governance: Portland in Oregon and Fife in Scotland. The Scottish dirigiste approach offers its local councils a consistent policy framework, allowing them to focus on specific measures to reduce greenhouse gas emissions, while avoiding concerns about free-rider effects from non-participating councils. The asymmetrical uptake of climate change measures by United States municipalities exposes their domestic market to the risks of carbon leakage that America sought to avoid in global markets during negotiations over the Kyoto Protocol.

Keywords: Environmental governance; local government climate change action plans; Scottish local authorities; United States municipalities; City of Portland, Oregon; Fife Council; carbon leakage.

*Corresponding author.

Introduction: Fishing from the Same Pool

Gordon's (1954) seminal paper on the allocative consequences of free access to deep-sea fisheries revealed how lack of regulation leads to over-exploitation of global common property resources such as the atmosphere. In tackling climate change, everyone fishes from the same pool: individual attempts to moderate usage produce common benefits. Yet if free-riders who gain from such efforts without making a contribution cannot be induced to share the burden, this may trigger **Hardin's** (1968) tragedy of the commons. Sustainable management of these resources requires effective environmental governance, capable of implementing mutually-agreed targets at all levels of decision-making. **Paavola** (2007: 93) depicts this process as "the establishment, reaffirmation or change of institutions to resolve conflicts over environmental resources".

Our paper traces the different modes of environmental governance which are evolving within the local government sectors of the United Kingdom (UK) and the United States of America (USA) to tackle climate change. After reviewing their divergent national fuel and energy policy frames for controlling greenhouse gas (GHG) emissions, we track the local climate change mitigation responses of two of their sub-national jurisdictions, chosen to exemplify best practice in each country. Scotland, a devolved part of the UK that recently legislated for some of the most stringent climate change targets in the world, is compared with the US Pacific Northwest, where states and municipalities are in the forefront of American responses to climate change.

Comparative analysis indicates that the chosen mode of environmental governance helps shape the delivery of a jurisdiction's climate change actions at local level. Scotland favours a dirigiste, or centrally-directed, top-down delivery mode. The US Pacific Northwest has developed bottom-up multi-level modes of environmental governance to fill the vacuum created by the absence of a federal mandate on climate change. The strategies driving the climate change action plans of local councils in these two sub-national jurisdictions mirror these variations in their environmental governance, even when the targets they adopt for reductions in GHG emissions are strikingly similar. We explore this hypothesis further by evaluating the climate change plans of two pioneers of local environmental governance: the City of Portland in Oregon, and Fife Council on the east coast of Scotland. Our findings suggest that the viability of any local climate change action plan ultimately depends on the validity of the policy assumptions underpinning its mode of environmental governance.

Dirigisme Versus Federalism in Environmental Governance

Variations in modes of environmental governance

As [Ostrom \(2006\)](#) has emphasised, the way in which jurisdictions choose to pursue the governance of environmental issues offers an insight into their value systems, revealing preference sets that are deeply embedded in the fabric of their political and institutional makeup. Our evaluation of the relative merits of dirigiste, comprehensive, top-down versus voluntary, asymmetrical, bottom-up climate change plans adds to current discourses on the role of environmental governance in managing common property resources. These look beyond conventional neo-classical modes of governance to their institutional and free-market alternatives ([Slavikova et al., 2010](#)).

The land use planning regimes in our chosen jurisdictions demonstrate these competing environmental governance discourses, offering Scotland a dirigiste mode of governance that US legislators have eschewed. The 1947 Town and Country Planning (Scotland) Act removed development rights from all land-owners, requiring Scottish local authorities (SLAs) to exercise these on behalf of their communities through a system of statutory development plans covering the whole country. Following legislative devolution in 1999, these development plans are subject to extensive policy direction from the Scottish Government, including a statutory requirement to contribute to sustainable development. Plans must set out indicative future land uses and offer “clear guidance on what will or will not be permitted and where” ([SG, 2010b](#): para. 14).

These powers enable Scottish climate change legislators to set low carbon targets for new developments. Section 72 of the Climate Change (Scotland) Act (CCSA) 2009 ([SP, 2009](#)) introduced section 3F into the Town and Country Planning (Scotland) Act 1997. Under this clause, any SLA acting in its capacity as a planning authority producing new development plans “must include policies requiring all developments in the local development plan area to be designed so as to ensure that all new buildings avoid a specified and rising proportion of the projected GHG emissions from their use, calculated on the basis of the approved design and plans for the specified development, through the installation and operation of low and zero-carbon generating technologies” ([SG, 2011b](#): para. 1).

By contrast, the separation of powers enshrined in the US Constitution supports the concept of federal dualism ([Carlarne, 2010](#)): individual states are free to determine whether to impose a land use planning mandate on their municipalities ([Bunnell and Jepson, 2011](#)). The 1969 National Environmental Policy Act

challenged this mode of environmental governance by establishing a federal Environmental Protection Agency (EPA), leading to a series of federal mandates, such as the 1970 Clean Air Act, the 1976 Federal Land Policy and Management Act and the 1977 Clean Water Act, enforcing federal environmental standards on US states. This surge in top-down US federal environmental mandates “departed from the dual tradition by pre-empting states’ rights in environmental matters and enlisting them in the implementation of federal environmental policies” (Wälti, 2009: 43).

Subsequent reaction to what advocates of free-market modes of environmental governance construed as the coercive federal environmental mandates of the 1970s (Scheberle, 2004) has frustrated attempts to form a coherent institutionalist approach to climate change governance in America. In reviewing the struggles over the past two decades to enact further federal environmental legislation, Lazarus (2009: 1164) reflects that:

“Land use controls are the federal government’s ‘third rail’ because of the related spectre of federal interference with state and local land use planning. The prospect of such federal disruption of state and local government prerogatives to determine land use development patterns has derailed several efforts by the EPA over the years to address air and water pollution caused by particular uses of land”.

Implications for fuel and energy fuel policies

These competing modes of environmental governance help explain the differences in national fuel and energy policies affecting our chosen jurisdictions. Fuel and energy accounted for 62% of all GHGs produced in Scotland in 2007 (SG, 2010a). As reserved functions under the 1999 devolution settlement, Scottish prices for these sectors are determined by dirigiste policies set by the UK Government. Reductions in UK energy costs delivered by privatisation of the sector in the 1980s have more recently been reversed by the adoption of demanding statutory obligations under the 2008 UK Climate Change Act (UK Parliament, 2008). These require an interim 34% reduction in the production of GHG emissions by 2020 compared to the 1990 baseline, on the way to an 80% reduction by 2050.

In order to meet its targets, the UK Government deploys a portfolio of taxes and other fiscal instruments to fund investments in low carbon sources of fuel and energy. McIlveen (2010) identifies ten separate low carbon measures applied to the energy sector and a further four borne by the transport sector. Each has a different implicit carbon price, measured in terms of marginal cost per unit of carbon saved, ranging from £3.26 per tonne of carbon dioxide equivalent for the climate change

levy on fuel oil up to at least £460 per tonne for feed-in tariffs for micro-generation (and possibly more for the renewable heat incentive and carbon capture and storage). Their cost is ultimately borne by UK consumers, in the form of higher energy tariffs, fuel costs and airline ticket prices.

UK fuel and energy policies operate within European Union (EU) parameters. An Energy Trading Scheme (ETS) applies cap-and-trade arrangements to the GHG emissions of the EU's major energy-intensive undertakings. By gradually restricting the allocation of allowances, the ETS should in theory be able to raise their traded price across the EU, stimulating greater energy efficiency and promoting a switch to renewables. However, the proliferation of additional carbon-saving fiscal instruments in the UK and other EU Member States has inadvertently had the effect of weakening the impact of the ETS (Carbon Retirement, 2011; Fankhauser *et al.*, 2011).

Recent UK Government proposals to reform the electricity market (DECC, 2010b) include setting a carbon floor-price for electricity generators to reinforce the ETS. Despite these efforts, the fuel and energy costs of meeting the UK's statutory climate change obligations remain daunting. The Department for Energy and Climate Change expects UK electricity prices to rise by 52% in real terms over the next twenty years, from £118 per megawatt hour to £179 (Lea, 2011).

Fuel and energy also provide the main sources of GHG emissions in the USA, accounting for 71% of the total in 2007 (Lutsey and Sperling, 2008: 677), yet policies for these sectors remain fragmented (Rabe, 2007). The US lacks a federal energy pricing structure: parts of the country with access to cheap sources of energy, such as the Pacific Northwest, enjoy substantially lower energy prices. Some parts of the country are tied into regional grid systems backed by state or federal legislation, and some regional energy markets have adopted multi-state legislation to apply cap-and-trade arrangements, allowing them to set an implicit carbon price for power (Selin and VanDeveer, 2011).

Investment in US generating capacity has not been designed with any national strategy in mind. US power supplies are delivered by a mix of state and municipal plants which operate alongside private sector utilities that may have to answer to local or state regulators for their pricing policies and investment decisions. In terms of vehicle fuel efficiency, Californian legislation has driven federal standards (Carlarne, 2010). Despite a 2007 Supreme Court ruling that the US Clean Air Act covers GHG emissions (Selin and VanDeveer, 2011), giving the EPA authority to draft plans to impose standards and apply penalties where appropriate, there are currently no proposals to augment these powers with federal fuel and energy policies designed to raise the costs of high-carbon supplies for US consumers and boost the demand for renewables (Byrne *et al.*, 2007).

The conservation and efficiency measures included in the 2007 Energy Independence and Security Act are expected to dampen the increase in US aggregate GHG emissions by 9% in 2030 compared to what would be a “business-as-usual” scenario. This still represents a 9% increase over the 2007 level and 27% over the 1990 Kyoto baseline (Dixon *et al.*, 2010: 6399). The US Energy Information Administration predicts that 38% of the additional generating capacity required by 2030 will be supplied by coal-fired plants (Dixon *et al.*, 2010: 6398).

Local Actions to Address Climate Change

Top-down versus bottom-up modes of climate change governance

Scotland and the US Pacific Northwest have adopted equally demanding climate change mitigation targets, but the strategies adopted for their delivery differ markedly. Scotland’s chosen mode of climate change governance is explicitly dirigiste in nature. The CCSA delivered what Scottish Ministers described as “world-leading legislation which can act as an example of best practice to other countries” (SG, 2010a: para. 4.1). Part 1 creates a statutory obligation to reduce Scottish GHG emissions by 80% in 2050 against a 1990 baseline, with an interim reduction target of 42% by 2020 (SP, 2009). The statutory duties placed on SLAs under Part 4 of the CCSA cover both mitigation and adaptation measures and came into effect at the start of 2011. SLAs must act in a way:

- best calculated to contribute to the delivery of the mitigation targets set in or under Part 1;
- best calculated to help deliver any programme laid before the Scottish Parliament under section 53 (which requires Scottish Ministers to produce adaptation programmes); and
- that they consider most sustainable.

Scottish Government guidance on discharging these duties (SG, 2011a) expects SLAs to draw on their corporate skills to deliver pro-active responses that set targets and milestones, and to integrate climate change policies into their corporate management. Prior to the CCSA, all 32 SLAs had already signed up to the Scottish Climate Change Declaration (SCCD, 2011). This established a voluntary climate change network requiring signatories to acknowledge the consequences of climate change and pledged co-operation in undertaking local climate change actions, including the production of annual reports on the performance of their carbon management activities.

The readiness with which SLAs make voluntary commitments and accept onerous new statutory duties in tackling climate change is explicable by the support they receive from top-down funding arrangements (Jackson *et al.*, 2012). SLAs only meet 20% of the cost of running their local public services directly from their own resources, via council (domestic property) taxes, fees and charges. The remaining 80% comes from a Scottish government block grant, which includes the proceeds of pooled local business rates.

The downside of this dependency on central funding is a weakening of local accountability and initiative. The costs of local environmental governance have largely been shifted from local to national taxpayers, enabling SLAs to blame any failure to deliver at local level on a lack of central government funding. Dirigiste systems of local government finance insulate individual SLAs from local economic vicissitudes, but reduce their incentive to pursue local development initiatives (Shakespeare *et al.*, 2011).

In the absence of any equivalent US federal mandate for funding climate change actions, municipal initiatives form a test-bed for competing institutional and free-market modes of multi-level environmental governance (Slavikova *et al.*, 2010), drawing on a mix of regional and state legislation, local government ordinances, and voluntary initiatives (Wheeler, 2008; Carlarne, 2010). Engel (2006: 7) observes that the “most striking aspect of state and local climate change activities is the fact that they are bottom up as opposed to top down”. At the municipal level, climate change governance is largely framed around two voluntary networks, both of which focus on mitigation targets rather than adaptation measures.

The more significant network was launched in 1993 by the International Council for Local Environmental Initiatives (ICLEI), as its Cities for Climate Protection (CCP) programme. Participating US municipalities are offered guidance, together with some modest funding and software packages, to adopt a five-step climate change mitigation planning process termed ‘milestones’:

- conduct a baseline emissions inventory and forecast
- adopt an emissions reduction target
- develop a local climate change action plan
- implement policies and measures
- monitor and verify results (CCP, 2007).

The second network is managed by the US Conference of Mayors, which endorsed a Climate Protection Agreement (CPA) sponsored by Pacific Northwest mayors at its 75th annual conference in Chicago in 2005 (Little, 2005). This urges “the federal government and state governments to enact policies and programs to meet

or beat the target of reducing global warming pollution levels to 7% below 1990 levels by 2012” (CPA, 2008). As Pitt (2010) notes, by 2009 each of these networks had attracted support from a significant proportion of US municipalities. Out of a total of some 4,000 US municipalities, 606 US had joined the CCP and more than 1,000 were in the CPA.

Implications of carbon leakage for local climate change actions

Without federal support, their continued heavy reliance on local sources of finance (Bird, 2006) should enhance the sensitivity of US municipalities to anything which pushes up the costs of local public services and threatens local tax bases. Economic theory offers little support for adopting bottom-up modes of governance to address environmental spillovers. Since the atmosphere is a common pool resource, free-riders can share any benefits from asymmetric municipal actions to address climate change without contributing to their costs (Betsill and Bulkeley, 2006). Moreover, assuming competitive factor markets, Oates and Schwab (1988) contend that individual jurisdictions which impose their own emissions limits to tackle global environmental externalities risk losing investment to those that do not, without achieving any compensating improvement in overall environmental quality (Engel and Saleska, 2005: 201)

Carbon leakage is the term used for the Oates and Schwab (1988) effect when applied to climate change. It was brought to prominence in debates over the wisdom of requiring only Annex 1 developed nations to commit to binding targets for GHG emission reductions under Article 3 of the Kyoto Protocol, which applies the principle of “common but differentiated responsibilities” for climate change (Grubb *et al.*, 1996). Representatives of countries which objected to this approach argued it would lead to a loss of business to jurisdictions without emissions controls, making the net change in global GHG emissions far smaller than the gross reductions delivered by Annex 1 countries. Multi-national businesses would be tempted simply to switch the location of their production to uncontrolled national jurisdictions, continuing to sell the same products to their consumers as imports rather than as domestic output.

The risk of carbon leakage is not confined to international agreements, being inherent in the structural changes common to all mature high-income economies. Ongoing de-industrialisation in these economies and a switch to service sector activities has seen many previously domestically manufactured goods imported. Increasing globalisation of trade allows the level of GHG emissions generated by the productive activities of high-income economies to be decoupled from the carbon footprint created by their consumers. Scotland’s production of GHG

emissions fell by 18.7% between 1990 and 2007, but emissions attributable to its footprint, calculated in terms of its consumption of goods and services including imports, rose by 14% over the same period (SG, 2010a). US GHG emissions showed a 17% increase between 1990 and 2006 when measured on a production basis, but this was boosted to 43% on a consumption basis (Brinkley and Less, 2010).

The Oates and Schwab (1988) critique indicates that the internal markets of any country subject to asymmetrical multi-level environmental governance are even more vulnerable to carbon leakage, since there are fewer barriers to domestic trade and movements of capital and labour are also much easier. If municipalities pursuing action plans force up local production costs, their consumers can switch to lower cost supplies from non-participating municipalities. This would frustrate efforts to lower local carbon footprints in participating municipalities and result in a smaller net overall reduction in US GHG emissions.

The implications for local economic development are equally worrying. Rising production costs attributable to local climate change actions might prompt some of their businesses to relocate to areas unaffected by such measures, adversely affect the prosperity of participating municipalities. The possibility of such an outcome when an economic union removes trade restrictions without ensuring that environmental standards are harmonised is characterised in the literature on environmental policy as a “race to the bottom” (Golub, 1998).

If the logic used by US negotiators in resisting the adoption of common but differentiated responsibilities under the Kyoto Protocol is applied to the American economy itself, the risk of domestic carbon leakage attributable to asymmetrical application of climate change controls by sub-national jurisdictions counts against bottom-up multi-level modes of climate change governance. It argues in favour of a uniform top-down federal mandate, applying what Slavikova *et al.* (2010) term an institutional rather than a free-market mode of environmental governance. So we need to explore whether US municipalities participating in local climate change actions recognise this risk and, if so, how they attempt to minimise it.

What prompts US municipalities to adopt climate change measures?

Amongst the factors driving the climate change actions of US municipalities, the role of state legislatures is a major consideration. Tang *et al.* (2010: 56) analyse forty climate change action plans produced by US municipalities to identify the main determinants of their quality, concluding that “the most significant predictor contributing to higher quality plans is the presence of state mandates” (Tang *et al.*, 2010: 56). Carlarne (2010: 267–8) notes that most US states opposing climate

change legislation have active oil and gas industries or limited capacity to produce renewable energy. Nevertheless, many US municipalities that lack a state mandate voluntarily participate in CCP and CPA programmes.

Zahran *et al.* (2008: 544) find that CCP membership is “partially determined by the relative distribution of costs and benefits that accompany policy action”, a finding which offers some support for advocates of a free-market mode of environmental governance. Participation is influenced by a number of external factors, with those exposed to natural calamities or a coastal location statistically more likely to favour membership and those with economic reliance on carbon-intensive activities such as coal-mining less so. However, the socio-economic make-up of a municipality outweighs these external determinants: “well-educated, politically liberal, urban communities, with a strong record of environmental activities, appear more supportive of policies to mitigate the adverse consequences of climate change” (Zahran *et al.*, 2008: 549). Their conclusion that the most likely US municipal CCP participants are those exposed to high geographical risk and having a strong record of support for environmental activities fits the Pacific Northwest.

Lutsey and Sperling (2008) estimate the overall impact of the US “bottom-up” approach to climate change mitigation. They trace a rapid uptake of precursors to GHG target-setting over the period 1994–2007, through the widespread application of local carbon inventories and the formulation of local action plans. By the end of this period, over 50% of states or cities had adopted GHG reduction targets, covering 30% of US emissions. In addition, many sub-national jurisdictions had adopted specific targets for vehicles and renewable energy, achieving similar coverage by 2007. They conclude that the aggregate effect of all these actions would still not allow US GHG emissions to fall below 1990 levels in coming decades.

This leads them to observe that US efforts at city and state level, although impressive, are insufficient to deliver major climate change abatement outcomes, arguing that without a top-down federal mandate applying national policies and fiscal instruments “enactment of state and local environmental policy initiatives may overlap and interaction with one another in negative ways” (Lutsey and Sperling, 2008: 674). Carbon leakage is identified amongst the range of such adverse asymmetrical effects, but seen as confined to the location of power supplies rather than affecting all sectors of local economic activity:

“the pitfall... of uneven performance by the various jurisdictions can have unintended consequences such as to encourage ‘shuffling’, whereby companies redirect their low-carbon products (such as hydro-electricity) to

jurisdictions with stringent rules and high-carbon products (such as coal-based electricity) to areas with weaker or non-existent rules” (*ibid.*).

Interviewing staff in US municipalities that had joined the CCP network, **Betsill (2001)** concludes that many had sold membership to their local communities on the basis of tangible paybacks in the form of cost-savings and additional communal benefits, rather than attempting to preach the environmental virtues of adopting unilateral climate change actions. Her findings indicate a degree of cherry-picking on the part of these municipalities. Gains from low-hanging fruit tended to be highlighted, such as more energy efficient utilisation of municipal plant, tighter building code standards for new build and retrofits, better mass transit and cycling provision, improved recycling and use of landfill methane. Harder decisions on incentivising local utilities to make a switch to renewables, which might drive up power costs, were generally avoided. She questions whether the CCP strategy can “lead to a meaningful local contribution to global efforts to mitigate climate change”, when “ICLEI officials emphasise the co-benefits of controlling local GHG emissions and often point to climate protection as a secondary consideration” (**Betsill, 2001**: 402).

These conclusions are echoed in **Kousky and Schneider’s (2003)** interviews with staff from twenty-three US municipalities seeking to establish why they engaged in climate change mitigation actions producing benefits from which free-riding non-participants cannot be excluded. Four possible hypotheses were explored: local cost savings could still be realised; local co-benefits existed; altruism prevailed; and political pressure took precedence over economic rationality. Staff responses strongly favoured the first two explanations. A city representative from Portland, Oregon, is quoted as saying most of its climate change programmes “were succeeding, not because of public understanding and support for mitigation efforts, but because of the co-benefits those same policies offered” (**Kousky and Schneider, 2003**: 368). The researchers conclude that specific costs savings could be identified and “a myriad of local co-benefits” were indeed available, but for “cities justifying their mitigation policies on private cost-savings alone”, once they “have successfully picked the proverbial ‘low hanging fruit’...the free-riding problem might re-emerge and inhibit mitigation action at higher levels of abatement” (**Kousky and Schneider, 2003**: 369).

Despite reservations from researchers about the ability of US municipalities to deliver effective local climate change plans, some types of economic co-benefits arising from voluntary actions go beyond simple cherry-picking. Municipal climate change initiatives are occasionally linked to “new economic geography” drivers, drawing on the appeal of a clean and green environment to attract

footloose innovative businesses and talented amenity migrants (Jackson *et al.*, 2008). These attributes can be promoted as part of package of local development measures that sold their community as a location for investments in innovative, knowledge-rich, creative centres of learning. As the following section of our paper demonstrates, this strategy has been adopted by at least one of the Pacific Northwest's main metropolitan areas, the City of Portland in Oregon State.

Case Studies of Local Scottish and US Pacific Northwest Climate Change Actions

Portland, Oregon

Portland operates under a number of Oregon State mandates for environmental governance. Since 1973, state law has required every city and county in Oregon to have a comprehensive plan to control land use decisions. In 1995 the eight local government bodies in the Portland region established Metro as the USA's first directly elected regional metropolitan authority, which is served by a multi-modal mass transit system operated by TriMet. In 2003 the West Coast Governors' Global Warming Initiative (embracing California, Oregon and Washington) committed these legislatures to GHG targets, and Oregon became the first US state to pass legislation setting GHG standards for the construction of new energy facilities (Carlarne, 2010). Oregon is also one of seven US states and three Canadian provinces participating in the Western Climate Initiative, developing a cap-and-trade system aiming to reduce to 15% below 2005 levels by 2020 the 90% of GHG emissions it covers (WCI, 2011). Together these innovative forms of multi-level environmental governance are intended to support more sustainable and energy efficient settlement patterns across the whole Portland metropolitan region (Young, 2010).

The current climate plan targets for the Portland metropolitan area (CPMC, 2009) emulate those in Scotland, seeking an 80% reduction in 1990 baseline GHG emissions by 2050, with an interim 40% reduction by 2030. The targets are not confined to municipal operations but cover all areas of local activity, and are designed to dovetail with a GHG emissions strategy adopted by Oregon State in 2005 which aims for a 75% reduction in GHG emissions by 2050. These remain indicative goals, whereas Scotland and its SLAs face statutory duties, but the Portland climate action plan can already point to significant achievements. Despite a 22% population increase over the same period, its GHG emissions fell by 1% between 1990 and 2008, compared with an overall US rise of 13% over the same period (CPMC, 2009: 19–20).

Portland's 1993 Carbon Dioxide Reduction Strategy was the earliest formally adopted by any US municipality (Rutland and Aylett, 2008). The city first started to worry about its energy supplies in the 1970s, when a series of droughts affected its local hydro-electric power capacity and an attempt to promote nuclear energy led to a municipal bond default and large increases in energy bills. Energy efficiency was central to the first municipal energy policy adopted in 1979. The Pacific Northwest Electric Power and Planning and Conservation Act passed by Congress the following year extended the existing Federal Columbia River Power System legislation. The Act provides support for regional energy efficiency and conservation measures, and makes future approval of investments in additional capacity contingent on demonstrating that no cost-effective alternative conservation projects can be identified.

A revamped 1988 city energy policy attempted to address continued increases in local energy consumption. An inventory system was introduced to identify more efficient ways of using locally generated energy sources. Trends in energy efficiency were measured against this baseline inventory, which excluded elements that were not considered to be within Portland's own sphere of influence, such as imports of energy intensive commodities like concrete, or air flights to and from Portland International Airport (Rutland and Aylett, 2008). The same sectoral methodology has been applied in setting GHG emissions targets, as the current climate change action plan acknowledges: "this plan focuses exclusively on actions that the City and County are positioned to carry out" (CPMC, 2009: 28).

These origins help explain the most interesting aspects of Portland's pioneering climate change status. The 1993 Carbon Dioxide Reduction Strategy was not simply the culmination of more than a decade of policies promoting the efficient use of locally-sourced energy. It was also the product of local development policies that sought to pre-empt the risk of carbon leakage. The rapid postwar expansion of the economies of the Pacific Northwest states was triggered by the introduction of abundant new local supplies of cheap hydro-electricity, stemming from an international agreement with Canada to fund a major scheme to dam the waters of the Columbia River. Hydro currently meets 27% of Oregon's electricity needs.

Coal-fired generating capacity provides 44% of the state's electricity supplies, with natural gas supplying a further 24% (CPMC, 2009: 34). These plants rely on non-local supplies, since Oregon has no fossil fuel reserves of its own, exposing local businesses and residents to energy market fluctuations over which they have little control. Faced with high marginal costs of augmenting local energy capacity in the form of additional imports of fossil fuels, Portland's pursuit of energy efficiency is justified not simply as environmentally sound but also as

economically essential: “[f]or businesses and ratepayers, the primary concern was that new investments in energy supply would cause price increases, as nothing could beat the low-cost energy flowing from sunk costs in hydro dams” (Rutland and Aylett, 2008: 635).

Portland emphasises the co-benefits of energy efficiency in order to sell its climate change policies on economic grounds. At the most basic level this involves demonstrating the money savings for local households and businesses. At a more sophisticated level, it is also a central element of the local economic development strategy adopted to deliver Portland’s climate change actions, forming a “Vision for 2050” in which:

“[g]reen jobs are a key component of the regional economy. Products and services related to clean energy, green building, sustainable food, green infrastructure, and waste use and recovery provid[e] living-wage jobs throughout the community, and Portland is North America’s hub for sustainable industry and clean technology” (CPMC, 2009: 16).

Local legislation on energy efficiency has already supported the emergence of new economic clusters drawing on expertise in green building (Allen, 2008) and renewable energy (Hayes *et al.*, 2008). The current climate change plan explicitly links new economic geography spinoffs emanating from the appeal of place and the promotion of a green economy to this strategy:

“[i]n a sustainable economy, people live and do business in ways that are good for the economy, the environment, and for communities. The usual tradeoffs between growth, sustainability and equity are not necessary. Businesses are more efficient, innovative and competitive internationally. The local talent pool is deeper.” (CPMC, 2009: 17).

These arguments are combined with the more traditional local economic development benefits linked to enhancement of the local income multiplier from reductions in the marginal propensity to import higher-cost energy supplies. Sustainability is seen as the justification for taking local action on climate change:

“[t]he past decade has proven that many of the technologies, products and services required for the shift to a low-carbon future can be provided by Portland-area companies. Dollars currently spent on fossil fuels will no longer leave our economy and will stay here to pay for home insulation, lighting retrofits, solar panels, bicycles, engineering, design and construction. City Council has adopted an economic development strategy that prioritises sustainability as the key economic engine of the Portland region” (CPMC, 2009: 8).

Championing an energy-efficiency development strategy allows Portland to avoid focusing on changes in the cost of fuel and energy associated with stringent climate change targets or their potential impact on local taxes (CPMC, 2009). This illustrates the expediency required to operate within a system of multi-level environmental governance that lacks clear federal leadership. Municipalities which adopt ambitious individual GHG reduction targets are obliged to show how they can minimise their exposure to the risk of carbon leakage associated with asymmetrical sub-national approaches to climate change. Very little is said in these plans about committing resources to adapting to climate change effects that cannot be avoided.

In Scotland, although some parts of the country will accommodate higher energy costs better than others, there is little point in any individual SLA making a play for energy efficiency as a way of increasing its local market share of Scottish economic activity. The UK government's push for low-carbon supplies will raise the costs of electricity for all consumers, forcing SLAs to incorporate rising energy prices in their local action plans. Equally, all SLAs are expected to adopt suitable adaptation measures to reduce exposure to inescapable climate change effects.

Fife, Scotland

In recent decades Fife Council has sought to position itself as the leading green SLA (Jackson and Roberts, 1997), participating in pioneering EU and UK initiatives with regard to sustainable development and environmental management (Jackson, 2000). It was an early signatory to SCCD, with its latest report under this initiative (FC, 2010) reporting on its voluntary progress with regard to climate change. Its Carbon Emissions Reduction Plan (FC, 2009) sets out the actions it intends to take to discharge its statutory obligations under the CCSA. These documents summarise the evidence base on which the council has achieved and continues to retain its Carbon Trust Standard. This assurance scheme, akin to the early stages of the CCP Milestones, assesses the SLA's capacity to establish a system for monitoring and controlling its own carbon footprint (FC, 2009: Annex 3iii).

Fife's Reduction Plan reveals similarities with Portland's approach in terms of methodology for measuring emissions and for setting targets, and differences in terms of the policies and measures applied to deliver these targets. The similarities reflect the shared technical concepts involved in addressing this problem at a local level, while the differences relate to the institutional context, which has shaped very different modes of environmental governance used by these two local councils. Fife Council's GHG emissions targets replicate those set out in the CCSA (FC, 2010: para. 1.2), and match those adopted by Portland.

Both councils adopt the sectoral, production-based, method for measuring their local carbon inventories as opposed to the systems, consumption-based, method. This means that the targets are measured against emissions produced within their own boundaries, rather than the carbon embodied in the products consumed therein, including imports. Each accounts for its own corporate emissions, predominantly involving energy, transport and waste management. The overall share of local carbon emissions caused by their corporate activities is very small: estimated at 1% of total local emissions in Portland (CPMC, 2009: 58), and 3% in Fife (FC, 2010: 9).

Where the plans differ markedly is in their overall coverage and in the policies and techniques chosen for delivering the targets set. In addition to addressing its corporate emissions, the Portland plan also extends its strategy to cover all local sources of activity, seeking an “integrated approach that goes far beyond reducing carbon emissions” and arguing that “climate protection must be inextricably linked with actions to create and maintain jobs, improve community liveability and public health, address social equity and foster strong, resilient natural systems” (CPMC, 2009: 8). The resulting agenda for tackling climate change covers eighteen specific objectives and related actions which “the City and County are positioned to carry out” (CPMC, 2009: 28). However, many of these are essentially aspirational and lack specific policy instruments for their delivery, relying on the creation of investment funds or the voluntary uptake of incentive schemes. Outside of its own corporate activities, there are few powers of enforcement available to Portland to implement many of the measures contained within its plan, and very little costing of any proposals.

Fife Council’s actions are drafted as a corporate business plan, setting out the business case for pursuing GHG emissions reductions in terms of financial costs and benefits to the SLA, without any attempt to win over the local business sector or the local electorate. This business case is supported by a set of appendices that identify the key parameters affecting the corporate plan:

- a report on the calculation and results of corporate carbon footprinting
- a summary of the policy context of the reduction plan
- a note on the CRC (see below)
- a “value-at-stake” assessment of the financial implications to the council of not meeting targets, amounting to “an additional £152.9m in energy, transport and CRC costs over 13 years” (FC, 2009: Appendix 5xi)
- a list of specific activities that make up the four components in the delivery of the programme: reviewing and strengthening corporate and service governance;

reviewing and strengthening support mechanisms; reporting, scrutiny and review of progress; ongoing monitoring and review

- a summary of key corporate roles and responsibilities
- a checklist indicating sources of support from specialist council services
- a project business case for a carbon emissions impact assessment tool
- a project proposal for introducing a carbon finance system in corporate activities
- outline of arrangements for a corporate carbon emissions audit
- a report on the application of a whole life costing tool developed for corporate procurement (FC, 2009).

The Carbon Emissions Reduction Plan makes no attempt to embody any wider elements of a local development strategy. Nor does it extend to other public bodies in Fife or to Fife's business, domestic or voluntary sectors, since these stakeholders are already the subject of other elements of Scottish and UK government climate change legislation. The dirigiste mode of environmental governance to which Fife Council is subject relieves it of the necessity to champion such interests except where they impinge on specific climate change actions for which it is responsible, such as the setting of increasingly demanding energy efficiency requirements for all new local developments approved through its statutory planning system (SG, 2011b).

Energy efficiency provides a good illustration of the dirigiste approach to Scottish environmental governance, both with regard to the corporate activities of SLAs and to their wider community responsibilities. Fife Council's corporate annual carbon footprint currently averages around 110,000 tonnes carbon dioxide equivalent (FC, 2010). The energy demands of its buildings account for 70% of this footprint, the two other main contributors being energy needs of its other infrastructure (12%) and fuel requirements for its vehicle fleet (13%). This typical SLA corporate emissions footprint explains the priority placed on public sector schemes in Scotland's Energy Efficiency Action Plan (SG, 2009).

The EU Directive on Energy Performance of Buildings (CEC, 2002) was transposed into Scottish law through amendments to Scottish building regulations (SP, 2008). Since January 2009, all large public buildings in Scotland (covering an area over 1,000 m²) must display an Energy Performance Certificate. The Directive reveals the poor energy efficiency of Scottish public sector buildings, the majority of which are operated by SLAs. A recent Scottish government report observes that this:

“illustrates the scale of the challenge in reducing emissions from the existing public sector estate. Over 70% of large public sector buildings

have an EPC rating of E to G [poor to very poor], with only 4% rated at A or B [very good or excellent]” (Audit Scotland, 2010: para. 57).

The dominance of central funding for SLA services breaks the link between poor council energy efficiency and higher local taxes, removing many of the corporate arguments used by Portland in selling its climate change action plan to its community. Instead, the UK Government is introducing a new fiscal instrument, the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme. All electricity consumers using over 6,000 megawatt hours of metered energy per annum not already directly subject to the ETS or Climate Change Agreements will be liable to the CRC, including 27 out of 32 SLAs.

Those included in the CRC must audit all their GHG emissions, something SLAs are already statutorily obliged to do under the CCSA. This information will be used to calculate individual allowances that must be purchased at an initial price of £12 per tonne of carbon dioxide equivalent (broadly in line with the current cost of acquiring allowances under the ETS). If Fife Council does not meet its planned corporate energy efficiency targets, this would expose it to £10 million in outlays on the CRC over the next decade (FC, 2009: Appendix 4iii). The UK Government intends to use the audited data generated by the CRC to publish an overall performance table, reinforcing the impact of financial sanctions against the inefficient use of energy.

SLAs are also being brought into another UK Government scheme, termed Green Deal (DECC, 2010c), to assist their local communities by funding domestic energy efficiency improvements. This replicates an energy investment programme, *Clean Energy Works: Portland*, jointly run by the Energy Trust of Oregon, the city and county governments and local energy utilities (CPMC, 2009: 31). Both schemes provide subsidised funding for homeowners to improve the energy efficiency of their homes, allowing the repayments to be offset against utility bills over 15 to 20 years.

Domestic energy demands for space and water heating and power account for 29% of all Scottish energy consumption (SG, 2009: 3). The prevalence of fuel poverty (defined as households devoting 10% or more of their disposable income to paying for domestic energy) continues to be a major obstacle to Scotland’s dirigiste approach to climate change (Dresner and Ekins, 2006). The most recent estimates put the number of households in Scotland alone who currently suffer from fuel poverty at 618,000 or 23.5% of the total (SG, 2009: 11).

Additional powers included in the Energy Security and Green Economy Bill (DECC, 2010c) give local authorities access to an Energy Company Obligation (ECO) designed to help those suffering fuel poverty. The UK Minister in charge of

the Bill is reported as saying that local councils are to have a key role in ensuring that the ECO is effectively spent for this purpose through new forms of engagement with the private sector, “with councils selecting a few preferred partners, who would deliver the Green Deal in their area according to street-by-street plans drawn up by councils prioritising the most vulnerable and the low-quality housing in their area” (Hayman, 2010: 11).

Despite this involvement in promoting domestic energy efficiency, Fife Council’s overall climate change strategy is demonstrably less holistic than Portland’s. This reflects the different mode of environmental governance under which it operates. Fife Council is not operating as an individual council voluntarily entering into commitments that other councils need not pursue. Although its record in terms of greening its activities is commendable (Jackson and Roberts, 1997; Jackson, 2000), Fife Council has little need to sell its actions to its own local businesses and electorate as a worthwhile investment designed to deliver a comprehensive strategy for local economic development, which embraces the precepts of a green economy and the new economic geography. Most of its funding comes from central government through a system designed to even out differences in the capacity to deliver local public services across all SLAs (Jackson, 1989), so Fife Council does not need to worry unduly about the impact on local activities of its spending plans.

Fife Council also has no need to share Portland’s concern that adoption of stringent climate change targets might undermine its economic competitiveness. The dirigiste nature of Scottish environmental governance requires all SLAs to adopt a similar approach to climate change. This uniformity of approach alleviates concerns about competitive distortions within the domestic market as well as eliminating the prospect of free-riders within the country’s local government sector. A similar approach to environmental governance within the EU seeks to minimise competitive distortions from asymmetric approaches to climate change at this level as well. The European Commission supervises broadly comparable climate change policy parameters, such as the ETS for businesses operating within the Single European Market, allowing them in return free access to its 501 million consumers (Schreurs *et al.*, 2009).

Conclusions

Asymmetrical sub-national US responses to climate change, stimulated by a bottom-up mode of multi-level environmental governance which has evolved to compensate for the absence of a top-down federal mandate, have delivered some significant reductions in local GHG emissions. As Kousky and Schneider (2003)

indicate, however, many local plans have focused on harvesting low hanging fruit, with participating US municipalities justifying their actions in terms of economic co-benefits and cost savings. Our case study of Portland demonstrates that even amongst the most committed municipalities the outcomes fall short of the major reductions in emissions being sought.

The mandates provided to their own municipalities by certain US states such as those in the Pacific Northwest, although invaluable in supporting local action plans, are not effective substitutes for coherent federal action on climate change. They do not address the problem of market distortions which asymmetrical forms of environmental governance generate when they are applied to an open domestic market susceptible to competitive pressures. Aside from allowing free-rider municipalities to opt out of bearing part of the costs while still sharing in any benefits, measures focusing solely on local level actions to implement effective reductions in GHG emissions expose participating municipalities to the risk of carbon leakage, offering the prospect of a loss of market share if substantive decarbonisation policies drive up their costs of production relative to non-participants.

This encourages elected representatives and officials of US municipalities such as Portland to justify their climate change plans by claiming that additional investments in energy efficiency will enhance local competitiveness. Engel and Saleska (2005: 22) observe that “few state and local climate initiatives currently impose mandatory emissions reductions from existing sources”. Rather than overtly implementing measures that might disadvantage local businesses, bottom-up US action plans pursue predominantly no-regrets policies, stipulating GHG inventories and registries, and tightening energy efficiency, building and renewable portfolio standards for new development consents (Engel, 2006; Byrne *et al.*, 2007).

Scotland’s dirigiste model of environmental governance presents a domestic level-playing field, enabling SLAs to focus solely on ways of delivering the stringent reductions in local GHG emissions demanded by top-down legislation, and leaving national policy-makers to worry about the implications for international trade of addressing climate change (Jackson, forthcoming 2012). Although free-riding and the risks of carbon leakage continue to be questions UK politicians must seek to resolve through multi-national environmental agreements (DECC, 2010a), dirigisme removes these concerns from the domestic market, since all UK councils are fishing from the same pool using the same tackle. Under this approach, effective local climate change actions depend on well-designed principal-agent arrangements. Funding systems must incentivise SLAs to discharge their CCSA duties, and ensure that UK government energy efficiency initiatives soften the impact of higher energy costs.

Efforts by US municipalities to bypass federal inactivity with regard to climate change have demonstrated their capacity to formulate an alternative multi-level mode of environmental governance, but the downside to this approach is analogous to the concerns expressed by US representatives during negotiations over the Kyoto Protocol. The concept of common but differentiated responsibilities set out in Article 3 of the protocol was resisted by US negotiators on the grounds that nations exempt from binding commitments to reductions in GHG emissions might benefit from shifts in the pattern of trade towards what would become lower-cost centres of global production (Selin and VanDeveer, 2011). Yet this is precisely what the form of climate change governance evolving within their own country is threatening to do with US domestic trade patterns.

The implications for US policy-makers of sanctioning competing modes of multi-level environmental governance to deliver the country's primary means of tackling climate change are profound. By permitting fishing from the same pool with different tackle, asymmetrical local climate change actions across US municipalities threaten to separate the US economy into areas in which green activities are encouraged as against areas in which brown activities are condoned. The emergence of domestic market segmentation simultaneously undermines American productivity and lessens the impact of local efforts to reduce GHG emissions. These are sufficiently worrying possibilities to warrant a resurrection of clear and adequately funded federal environmental mandates to address climate change, and a reversion to a top-down mode of environmental governance for addressing this issue.

References

- Allen, JH (2008). Portland's green building cluster: Economic trends and impacts. *Economic Development Quarterly*, 22(4), 303–315.
- Audit Scotland (2010). *Improving Energy Efficiency: A Follow-up Report*, Edinburgh, Audit Scotland.
- Betsill, MM (2001). Mitigating climate change in US cities: Opportunities and obstacles. *Local Environment*, 6(4), 393–406.
- Betsill, MM and H Bulkeley (2006). Cities and the multilevel governance of global climate change. *Global Governance*, 12(2), 141–159.
- Bird, RM (2006). *Perspectives in Fiscal Federalism*, Herndon VA, World Bank.
- Brinkley, A and S Less (2010). *Carbon Omissions: Consumption-based Accounting for International Carbon Emissions*, London, Policy Exchange.
- Bunnell, G and EJ Jepson (2011). The effect of mandated planning on plan quality: A fresh look at what makes a 'good' plan. *Journal of American Planning Association*, 77(4), 338–353.

- Byrne, J, K Hughes, W Rickerson and L Kurdgelashvili (2007). American policy conflict in the greenhouse: Divergent trends in federal, state, and local green energy and climate change policy, *Energy Policy*, 35(9), 4555–4573.
- Carbon Retirement (2011). *Maximising the Efficiency of the CRC: A Proposal to Ensure Energy Efficiencies Translate into Genuine Emissions Reductions*, London, Carbon Retirement Ltd.
- Carlarne, CP (2010). *Climate Change Law and Policy: EU and US Approaches*, Oxford, Oxford University Press.
- CCP (2007). *Cities for Climate Protection Campaign Milestone Guide*, Berkeley CA, International Council for Local Environmental Initiatives–United States.
- CEC (2002). *Directive 2002/91/EC on the Energy Performance of Buildings*, Brussels, Commission of the European Communities.
- City of Portland and Multnomah County (CPMC) (2009). *Climate Action Plan 2009*, Portland, City of Portland Bureau of Planning and Sustainability.
- CPA (2008). *Climate Protection Agreement*, US Conference of Mayors, accessed January 2011, <http://usmayors.org/climateprotection/agreement.htm>.
- DECC (2010a). *Beyond Copenhagen: The UK Government's International Climate Change Action Plan*, Cm 7850, London, Department of Energy and Climate Change.
- DECC (2010b). *Electricity Market Reform: Consultation Document*, Cm 7983, London, Department of Energy and Climate Change.
- DECC (2010c). *The Green Deal: A Summary of the Government's Proposals*, London, Department of Energy and Climate Change.
- Dixon, RK, E McGowan, G Onysko and RM Scheer (2010). US energy conservation and efficiency policies: Challenges and opportunities, *Energy Policy*, 38(11), 6398–6408.
- Dresner, S and P Ekins (2006). Economic instruments to improve UK home energy efficiency without negative social impacts, *Fiscal Studies*, 27(1), 47–74.
- Engel, KH (2006). State and local climate change initiatives: What is motivating state and local governments to address a global problem and what does this say about federalism and environmental law? *University of Arizona Legal Studies Discussion Paper*, No. 06–36
- Engel, KH and SR Saleska (2005). Subglobal regulation of the global commons: The case of climate change. *Ecology Law Quarterly*, 32(2), 183–233
- Fankhauser S, C Hepburn and J Park (2011). Combining multiple climate policy instruments: How not to do it, *Economics and Policy Working Paper No. 48*, London, Centre for Climate Change.
- Fife Council (FC) (2009). *Carbon Emissions Reduction Plan*, Glenrothes, Fife Council Sustainability Team.
- Fife Council (FC) (2010). *2009/10 Progress Report on Scotland's Climate Change Declaration*, Glenrothes, Fife Council Sustainability Team.
- Golub, J (1998). Global competition and EU environmental policy: Introduction and overview, in Golub J ed. *Global Competition and EU Environmental Policy*, London, Routledge, 1–33.

- Gordon, HS (1954). The economic theory of a common-property resource: The fishery. *Journal of Political Economy*, 62(2), 124–142.
- Grubb, M, C Vrolijk and D Brack (1999). *The Kyoto Protocol: A Guide and Assessment*, London, Royal Institution of International Affairs.
- Hardin G (1968). The tragedy of the commons. *Science*, 162(3859), 1243–1248.
- Hayes, C, D Rafkind and B Byrd (2008). Analysis of clean energy workforce needs and programmes in Oregon, quoted in City of Portland and Multnomah County (2009) *op.cit.*, 17.
- Hayman, A (2010). Minister outlines council role in delivering energy saving scheme, *Local Government Chronicle*, 25 November, 10–12.
- Jackson, T (1989). The Scottish Client Group approach: Indicators of need or discretionary variations in expenditure? *Journal of Public Policy and Administration*, 4(2), 35–47.
- Jackson, T (2000). Integrating environment and economy in a Scottish council: The case of Fife, in Gouldson A & Roberts P (eds.) *Integrating Economic Development and Environmental Management: Strategies for Local and Regional Government*, London, Routledge, 205–223.
- Jackson, T (forthcoming 2012). Global warming and the cooling of the special relationship: The contribution of climate change in shaping US-UK environmental politics since the end of the Cold War, in Dobson A & Marsh T (eds.). *The US-UK Special Relationship Over the Past 70 Years*, London, Routledge.
- Jackson T, D Gopinath and J Curry (2012). Dirigiste and Smart Growth approaches to urban sprawl: Lessons from Scotland and British Columbia. *Journal of Transatlantic Studies*, 10(11), 45–67.
- Jackson, T, BM Illsley, J Curry and E Rapaport (2008). Amenity migration and sustainable development in remote resource-based communities: Lessons from northern British Columbia. *International Journal of Society Systems Science*, 1(1), 26–48.
- Jackson, T and P Roberts (1997). Greening the Fife economy: Ecological modernisation as a pathway for local economic development. *Journal of Environmental Planning and Management*, 40(5), 617–633.
- Kousky, C and SH Schneider (2003). Global climate policy: Will cities lead the way?, *Climate Policy*, 3(4), 359–372.
- Lazarus RJ (2009). Super wicked problems and climate change: Restraining the present to liberate the future. *Cornell Law Review*, 94(5), 1153–1234.
- Lea, R (2011). Energy shake-up will lift electricity bills to £1,000 in 20 years, *The Times*, 3 January, 35.
- Little, A (2005). An interview with Seattle Mayor Greg Nickels on his pro-Kyoto cities initiative, <http://www.grist.org/article/little-nickels>, accessed 5 April 2011.
- Lutsey, N and D Sperling (2008). America's bottom-up climate change mitigation policy, *Energy Policy*, 36(2), 673–685.
- McIlveen, R (2010). Cutting the cost of carbon, in Less S ed *Greener, Cheaper*, London, Policy Exchange, 14–51.

- Oates, WE and RM Schwab (1988). Economic competition among jurisdictions: Efficiency enhancing or distortion inducing?. *Journal of Public Economics*, 35, 333–354.
- Ostrom, E (2006). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, Cambridge University Press.
- Paavola, J (2007). Institutions and environmental governance: A reconceptualisation, *Ecological Economics*, 63(1), 93–103.
- Pitt, D (2010). The impact of internal and external characteristics on the adoption of climate mitigation policies by US municipalities. *Environment and Planning C: Government and Policy*, 28(5), 851–871.
- Rabe, BG (2007). Beyond Kyoto: Climate change policy in multilevel governance systems. *Governance: An International Journal of Policy, Administration and Institutions*, 20(3), 423–444.
- Rutland, T and A Aylett (2008). The work of policy: Actor networks, governmentality, and local action on climate change in Portland, Oregon. *Environment and Planning D: Society and Space*, 26(4), 627–646.
- SCCD (2011). *Scottish Climate Change Declaration*, <http://climatechange.sustainablescotland.net> accessed 14 January.
- Scheberle, D (2004). *Federalism and Environmental Policy*. Washington DC, Georgetown University Press.
- Scheurs MA, H Selin and SD VanDeveer (eds) (2009). *Transatlantic Environment and Energy Politics: Comparative and International Perspectives*. Farnham Surrey, Ashgate.
- Selin, H and SD VanDeveer (2011). US climate change politics and policymaking. *WIREs Climate Change*, 2(1), 121–127.
- SG (2009). *Conserve and Save: The Energy Efficiency Action Plan for Scotland*. Edinburgh, Scottish Government.
- SG (2010a). *Climate Change in Scotland Annual Report 2009–2010*. Edinburgh, Scottish Government.
- SG (2010b). *Scottish Planning Policy*. Edinburgh, Scottish Government.
- SG (2011a). *Public Bodies Climate Change Duties: Putting Them into Practice: Guidance Required by Part 4 of the Climate Change (Scotland) Act 2009*. Edinburgh, Scottish Government.
- SG (2011b). *First Annual Report on the Operation of Section 72 of the Climate Change (Scotland) Act 2009*. Edinburgh, Scottish Government.
- Shakespeare, T, T Simpson and A Thompson (2011). *The Rate Escape: Freeing Local Government to Drive Economic Growth*. London, Localis.
- Slavikova, L, T Kluvankova-Oravska and J Jilkova (2010). Bridging theories on environmental governance. *Ecological Economics*, 69(7), 1368–1372.
- SP (2008). *The Energy Performance of Buildings (Scotland) Regulations 2008*. Edinburgh, Scottish Parliament.
- SP (2009). *Climate Change (Scotland) Act 2009*. Edinburgh, Scottish Parliament.

- Tang, Z, SD Brody, C Quinn, L Chang and T Wei (2010). Moving from agenda to action: Evaluating local climate change action plans. *Journal of Environmental Planning and Management*, 53(1), 41–62.
- UK Parliament (2008). *UK Climate Change Act 2008: Chapter 27–Climate Targets and Budgeting, the Committee on Climate Change, Trading Schemes, Impact of and Adaptation to Climate Change, etc.* London, Palace of Westminster.
- Wälti, S (2009). Intergovernmental management of environmental policy in the United States and the EU, in Scheurs, MA, Selin H and SD VanDeveer (eds). *op.cit.*, 41–56.
- WCI (2011). *Clean Energy: Creating Jobs, Protecting the Environment*. Western Climate Initiative at www.westernclimateinitiative.org accessed May 2011.
- Wheeler, SM (2008). State and municipal climate change plans: The first generation. *Journal of the American Planning Association*, 74(4), 481–496.
- Young, J (2010). Financial crisis and competitive challenges as drivers of a renewed regional agenda in the Portland area: Overcoming gaps and divisions between institutions and localities. *Regions*, 280, 31–32.
- Zahran, S, SD Brody, A Vedlitz, H Grover and C Miller (2008). Vulnerability and capacity: Explaining local commitment to climate-change policy. *Environment and Planning C: Government and Policy*, 26(3), 544–562.