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Key Regional Actors and Sector Opportunities for International Climate Change Cooperation

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Framing Memo for the Workshop “Key Regional Actors and Sector Opportunities for International Climate Change Cooperation”

by

Joshua W. Busby

**Associate Professor, LBJ School of Public Affairs
University of Texas-Austin**

As the international community attempts to reach an historic breakthrough in climate diplomacy this year, a sustained surge of national climate policies can aid negotiations and implementation of the resulting agreement. International cooperation between regions and countries that make up the engines of the world economy can carry this forward in a significant way. The recent US-China and US-India agreements demonstrate ways to bridge the divides that frame climate negotiations. The New York Declaration on Forests shows how key players in an economic sector can effectively formulate a plan that solves a key portion of the climate puzzle. What other areas are suitable for international climate cooperation? What elements of key national and regional political economies can be identified that have a significant effect on climate? How can key stakeholders bring together policies around these issues? Can sectors that have received working-level attention in recent years — energy production, energy efficiency, and monitoring — cross these distances between regions and nations and be elevated in the global agenda? What are the implications for Paris 2015 and beyond?

This short framing memo summarizes the goals for the workshop, the impetus for the workshop, the notion of sectors, and preliminary thoughts from some existing sectoral approaches to climate change.

Goals

This day and a half long workshop to be held May 27 and 28, 2015 in Austin, Texas will bring together about 15 stakeholders from key countries and regions to identify political and economic drivers of their climate policies and implications for international collective action. Countries include the major emitters of the United States, China, Europe, India, and a handful of others. Other regional representatives could come from Latin America, the Middle East, East Asia, Africa, and Australia.

The aim of the workshop is (1) to assess the political economy of domestic implementation of ambitious climate mitigation goals, (2) to discuss the lessons and prospects of international cooperation on sectoral and thematic areas (such as forests, energy production, energy efficiency, and monitoring), (3) and to identify how these domestic actions and sectoral opportunities affect country negotiating strategies going into Paris 2015 and beyond.

Impetus

The central assumption animating this workshop is that if an agreement emerges from the Paris climate negotiations at the end of this year, whatever agreement emerges will be important but ultimately require supplementary processes that help build confidence and political support for the wider regime. Complementary sectoral avenues like those already being explored on forests will have to be pursued to break the problem down to something more manageable, involving a more limited number of actors and a more tractable narrower slice of the problem.

One of the main lessons of the literature on collective action is that large numbers of actors with heterogeneous preferences are difficult to resolve. As many have argued, the UN venue of 190+ nations covering the gamut of the climate issue space, coupled with tens of thousands of observers with varying agendas, hampers effective action.¹ The problem is made all the more challenging when one realizes that climate change is a problem space different from other problems like arms control where states could credibly commit to reducing weapons because they control them directly. In the climate arena, states have to depend to a great extent on the implementation by thousands if not millions of private actors and sub-national governmental units.

As a consequence, top-down initiatives coming from the international community such as the Kyoto Protocol have proven to be politically intractable.² With the Copenhagen and Cancun agreements, we are decisively in a world of bottom-up commitments, epitomized by the Intended Nationally Determined Commitments (INDCs). The problem is that in a world in which individual countries make a best offer based on national circumstances, the collective aggregation of those commitments is likely to be far lower than what is needed to keep climate change from far surpassing the 2 degrees threshold for avoiding dangerous climate change.³

¹ Busby 2010; Busby 2008; Sandler 2004; Barrett 2003; Oye 1986.

² Purvis 2004; Bodansky 2001.

³ UNEP 2014.

As analysts have noted, the problem of climate mitigation looks a little less daunting when one views it through the lens of the major emitters. As Figure 1 notes, if we treat the European Union as a unitary actor (though that is increasingly problematic), 12 emitters are responsible for ¾ of global emissions of greenhouse gases.

Total GHG Emissions Including Land-Use Change and Forestry (MtCO₂e)⁴ – 2011

World	43816.7343	% of Global Emissions
China	10552.6054	24.08%
United States	6550.0981	14.95%
European Union (28)	4540.9445	10.36%
India	2486.1713	5.67%
Russian Federation	2374.3143	5.42%
Japan	1307.4082	2.98%
Brazil	1131.1022	2.58%
Germany	882.9341	2.02%
Indonesia	834.5754	1.90%
Canada	716.2074	1.63%
Iran	715.5275	1.63%
Mexico	699.0501	1.60%

Source: WRI – CAIT

If we examine within individual sectors, emissions are concentrated further still. Of the 2097 MtCO₂ in net emissions from land use and forestry in 2011, emissions from Indonesia (1218 MtCO₂) and Brazil (288 MtCO₂) amounted to 1506 MtCO₂, more than 70% of the total.⁵

Similarly, for industrial processes, China was responsible for 45% of emissions in 2011, some 1256 of 2743 MtCO₂. Adding in the United States (243 MtCO₂), the EU-28 (214 MtCO₂), India (161 MtCO₂), and Japan (79 MtCO₂) totals 1954 MtCO₂, 71% of the total.⁶

Projections of future emissions growth suggest the bulk of emissions will come from the developing world, particularly China and India. In the IEA's New Policies Scenario for 2035, which includes some modest actions to restrain emissions, world CO₂ emissions will increase from 31161 million tonnes (MT) to 37242 MT, an increase of 6081 MT. Of that projected increase, China and India alone are projected to be responsible for more than 72% of that total. Power generation alone will drive much of the emissions growth in China, 58% of the project increase, and to a lesser extent in India (36% of the project increase).⁷

Within individual sectors, there is also great variation in the number of actors responsible for the problem, with some sectors (such as agriculture) and sources of emissions (such as from traditional fuel sources, namely low efficiency cookstoves) generally quite diffuse and difficult to organize. Other sectors/sources of emissions such as airlines, shipping, and automobiles may have a smaller number of companies that make the technology, even if there are a large number of end users.

These concentrated sources of emissions provide nodes or focal points where large emissions reductions can be possible, provided the actors are willing or governments have both a strong commitment and capability to enforce new rules. On the other hand, concentration of emissions can also translate into important political power at the national or subnational level.

⁴ MtCO₂e is a million tonnes of CO₂ equivalent. CO₂ equivalents are based on 100-year global warming potential (GWP) estimates produced by the IPCC.

⁵ World Resources Institute 2015.

⁶ Ibid.

⁷ International Energy Agency 2013.

If the agents responsible for a large share of emissions are implacably opposed to action, then the challenge of regulation and market change can be tricky.⁸

What these observations mean is that the number of countries that matter for mitigation in general and in particular sectors is much reduced. The collective action challenges of organizing a dozen countries is less onerous than trying to organize action by the entire international system. The challenge is reduced further still if emissions sources are concentrated in particular sectors and the number of sources responsible for emissions is limited to a handful of players.

So called “climate clubs,” that is minilateral processes with small groups of actors, have become increasingly popular venues in recent years. Clubs of major economies and other relevant actors provide useful forums for advancing the agenda in specific arenas. Clubs potentially have the advantage of offering selective benefits to members, thereby incentivizing membership since non-members do not want to be left out.⁹

For example, in the ozone arena, three countries, the U.S., Japan, and Russia were responsible for more than 40% of emissions of chlorofluorocarbons (CFCs), the chemicals responsible for the ozone hole. 12 countries were responsible for 78% of emissions. There were only 16 producers in the world of CFCs. In the United States, just five companies were responsible for all of US production, with Dupont responsible for almost half (49%) itself. As Sandler notes, industry concentration and the potential for future profits from alternatives to CFCs meant that the main producer companies all stood to gain.¹⁰

While there are many reasons the climate problem on its face is a more difficult problem to resolve than ozone, analysts in recent years have been searching for sectors and sources of emissions in the climate space such as hydrofluorocarbons (HFCs) where some similar elements of national and producer-level market concentration are evident.¹¹

The emergent climate regime complex of fragmentation and overlapping organizations operating in this space, is on some level a normal consequence of the nature of the issue, sprawling and multidimensional, and one that ought to be managed to ensure the greatest likelihood of containing the climate threat.¹² A sectoral approach to climate change recognizes this reality and embraces it.

The UNFCCC struggles to have the kind of authority or hierarchy in the international system to command or fully coordinate all of the various pieces with an interest in this agenda.¹³

In short, the lesson from this kind of analysis is to decompose the problem to focus on the big emitters, the sectors with the largest sources of emissions, and the actors within sectors responsible for a large share of emitters (big emitters/big sectors/big actors).

What Do We Mean By Sectoral Processes?

When we think about sectors, we often think about general categories of sources of emissions from a common economic activity. In the World Resources Institute’s emissions analysis tool CAIT, emissions are subdivided into the following sectors: energy, industry, agriculture, waste, land use change and forests. They divide further by sub-sector. Energy is decomposed still further into (1) electricity/heat (2) manufacturing/construction (3) transportation (4) fugitive emissions and (5) other fuel-combustion.

In the EDGAR platform from the European Union, activities are further divided by gas and by “process group.” There are separate datasets for methane (CH₄), nitrous oxide (N₂O), and HFCs. Within CO₂ emissions, there are a number of different categories: agricultural soils, biomass burning, chemical process solvents, energy industry, combustion in manufacturing industry, metal processes, transformation non-energy use, non-metallic mineral processes, oil production and

⁸ On market transformations and industry concentration in the climate arena, see Chapter 7 in Kapstein and Busby 2013.

⁹ Nordhaus 2015.

¹⁰ Sandler 2004, 217.

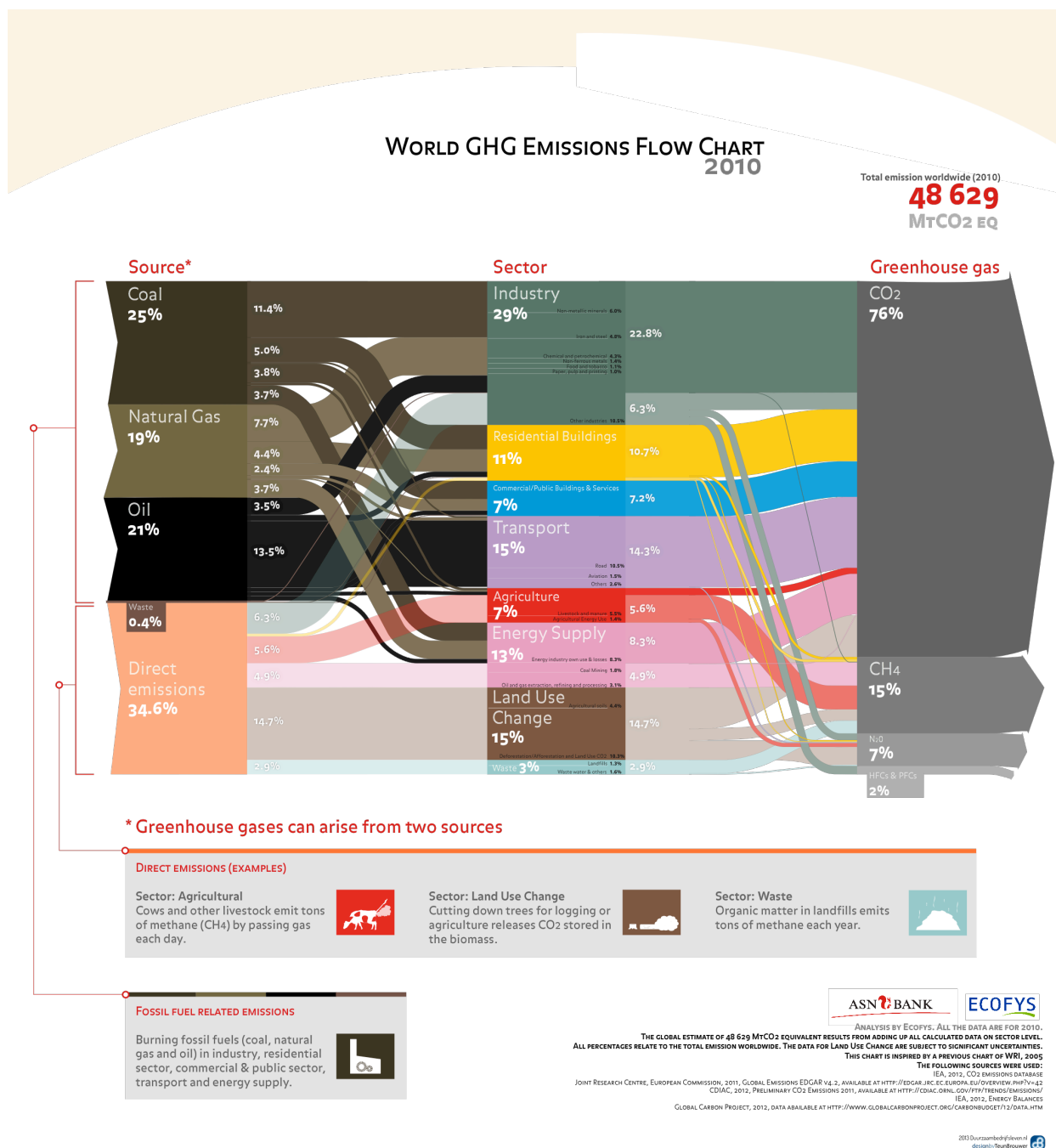
¹¹ Victor, Kennel, and Ramanathan 2012.

¹² Keohane and Victor 2011.

¹³ On the limited organizational slack of the UNFCCC secretariat, see Siebenhüner 2009.

refining, buildings, solid waste disposal, fossil fuel fires, international and domestic aviation, international and domestic shipping, non-road ground transport, and road transportation. Within these categories, there are further divisions.¹⁴

Updating a methodology pioneered by WRI, sometimes emissions are mapped in a flow chart to end use as shown below in this map from Ecofys.¹⁵ On the left-hand side are fuel sources and direct emissions. In the middle are sectoral emissions from industry, residential buildings, commercial buildings, transport, agriculture, land use change, and waste. On the right-hand side, greenhouse gases are depicted. This graphic is reasonably comprehensive but does not capture other processes like black carbon (or soot), a recently recognized climate forcer.¹⁶



¹⁴ European Commission 2011.

¹⁵ ECOFYS 2013.

¹⁶ Raes et al. 2011.

At some level, sector-based action can be organized to address emissions at different levels. One can aggregate up to combine things at a higher level of aggregation (such as agriculture) or one can decompose and look at a more clearly identifiable area of economic activity (such as the cement sector). As the 2007 WRI study *Slicing the Pie* noted: “These may range from activities as well-defined as iron and steel production to sweeping categories such as power generation or land use, land-use change and forestry (LULUCF), which can represent the vast majority of emissions in many countries.”¹⁷ The further one sub-divides, the more coherent and clear the actors involved and the available technologies to address the problem. However, one risks losing leverage over a large share of emissions, making the collective action challenges as formidable as ever.

While the logic suggested earlier (big countries/sectors/actors) remains, there are smaller sectors where progress may be possible where success may build confidence to work on sectors of greater importance. Combine this with the recognition that some gases last longer in the atmosphere and we immediately come to appreciate the importance of efforts to address short-lived forcers like methane, HFCs, soot, and tropospheric ozone through the Climate and Clean Air Coalition (CCAC).¹⁸

The word “sector” or “sectoral” approaches to climate change may be slightly misleading. One can also think of the word “segment” or “sphere of action.” Thus, while energy efficiency is a clear category of emissions in terms of production, one can think of large-scale energy efficiency initiatives from which one could generate large-scale emissions reductions. While one could decompose the field of energy efficiency further in terms of buildings and industry efficiency, it may make sense to aggregate up.

Moreover, when we think about particular challenges that are unlikely to have a strong resolution at Paris, additional complementary processes at the minilateral or sectoral level may be helpful. For example, the monitoring agenda or MRV (monitoring, reporting, and verification) is unlikely to deliver a very strong outcome at Paris. The Chinese have indicated that they object to strong outside monitoring mechanisms, and though the U.S. would have preferred a stronger agreement, the Obama Administration has decided that this is not a deal-breaker outcome for the meeting.¹⁹ Instead, they hope to secure the best possible agreement in Paris and leave MRV for NGOs, universities, and quite possibly, a sectoral complementary process to address.

Existing Sectoral Approaches

In preparation for this workshop, we sought to identify the names and main attributes of the various sectoral approaches with which we are familiar. This [list](#) of about 20 is unlikely to be comprehensive, and we would welcome additional contributions. A printed version is available in the materials distributed for the workshop, and we have a more exhaustive version [on-line](#) which includes, the initiative, the sector, the functions, the creation date, members, and a cursory evaluation of each of them.

Select Examples of Sectoral Climate Mitigation Processes

Initiative	Sector
Major Economies Forum	Clean Energy (with some focus on all sectors)
New York Declaration on Forests	Forests
Fossil Fuel Subsidy Phaseout	Energy Production
APEC Declarations	Fossil Fuels
Norway's International Climate and Forest Initiative (NICFI)	Forests
International Civil Aviation Organization (ICAO)	Transportation
Regional Development Bank Initiative for Transportation? Asian Development Bank's Sustainable Transport Initiative	Transportation

¹⁷ Bradley et al. 2007, 2.

¹⁸ See <http://www.ccacoalition.org/>

¹⁹ Revkin 2014; Stern 2014; Davenport 2014. Busby and Shidore discuss these issues in a forthcoming paper. Busby and Shidore 2015.

Climate and Clean Air Coalition	Short-lived forcers
Montreal Protocol - Proposal to amend the treaty to phase down HFCs	HFCs
REDD (see Norway above)	Forests
Clean Energy Ministerial	Clean Energy Technology
C40	Cities (energy efficiency, energy, transport, SLCPs)
R20	Energy Efficiency, Renewable Energy
International Transport Forum	Transportation
The Africa Clean Energy Corridor Initiative (ACEC)	Renewable Energy
Global Fuel Economy Initiative	Transportation
International Maritime Organization	Transportation

These processes often involve more than just national-level governmental actors. Sub-national governments and private sectors (both for-profit companies and non-governmental organizations) participate in many if not all of them. Some of them may be incorporated (as some of them already have) in to on-going inter-governmental forums like the International Energy Agency, the G20, the International Maritime Organization, the International Civil Aviation Organization, the WTO, and the Montreal Protocol.

New processes like the Major Economies Forum, the Clean Energy Ministerial, and the already defunct Asia Pacific Partnership may be started by leading states in the international system, namely the United States. Others like the Climate and Clean Air Coalition may be backed by major states like the United States but be organized under the aegis of international organizations like UNEP (as in the case of CCAC) for the purposes of legitimacy and a greater likelihood of buy-in by other states in the international system.²⁰

Some processes like Reduced Emissions from Deforestation and Degradation (REDD+) may be backed by important middle powers; in the case of REDD+, Norway, which enjoys immense national reserves from fossil fuels, has made a commitment to finance large-scale avoided deforestation emissions, particularly in Indonesia.

Others processes like the C40 may be backed by normative entrepreneurs and super-empowered individuals, in this case Michael Bloomberg and the Clinton Foundation.

When we think about membership from an effectiveness perspective, we also have to assess if the right actors are included. For example, in terms of on-going efforts to address fossil fuel subsidies, several of the states most responsible for those subsidies, namely Iran and Venezuela are not members of the G20, the main body championing fossil fuel subsidy phaseout.²¹

Other processes may emerge in a more ad hoc fashion such as the New York Declaration on Forests which grew out of work supported by the Norwegian government, with leadership by climate consultancies and NGOs such as Climate Advisers, and addressed in important leadership events such as the World Economic Forum, Abu Dhabi Ascent, and the UN Secretary General's Climate Summit.

They can vary in their degree of formal membership criteria. Some may cover various issues while others have more narrow agendas. They may vary in rules and processes by which decisions are reached. They can also vary in the degree to which goals are quantified and the extent to which those goals are binding on participants, from the most aspirational to the most highly legalized. Like other international processes, they may have variable levels of monitoring and enforcement.²²

²⁰ On the importance of international organizations and legitimacy, see Abbott and Snidal 1998.

²¹ Busby 2014.

²² These criteria are similar to those Koremenos et al. identified in their evaluation of the design of international institutions: (1) membership rules, (2) scope of issues covered, (3) degree of centralization of authority, (4) rules for controlling the organization, (5) and flexibility of arrangements. Busby 2014.

Dimensions of Comparability of Sectoral Process

- Backers and entrepreneurs
- Kinds of members, membership criteria, and fit of membership to problem
- Scope of issues covered
- Decision processes
- Nature of commitments (general \leftrightarrow specific, non-binding \leftrightarrow legally binding)
- Monitoring (limited \leftrightarrow elaborate)
- Enforcement (none \leftrightarrow material sanction)

The key animating questions that set the stage for the workshop is which of these processes and configurations of processes are likely to be the most effective, that is in delivering large-scale emissions reductions and avoided emissions? Are some processes better suited than others to succeed? If so, why?

Not all sectoral efforts make sense or are likely to be successful. In their 2007 study on the topic, WRI noted a number of criteria that made international sectoral efforts more or less likely to succeed: the share of international exposure of the industry, the concentration of the actors, the uniformity of the production process, the role of the government, the ability to measure greenhouse gases, and the ability to attribute greenhouse gases. From this perspective, certain sectors like aviation, motor vehicles, steel, and aluminum looked more promising ventures for sectoral success.²³ Nearly a decade later, are these observations still valid?

TABLE 1 SUMMARY OF SECTOR ANALYSIS							
SECTOR	GHG EMISSIONS ISSUES	SHARE OF GLOBAL INTERNATIONAL EXPOSURE	CONCENTRATION OF ACTORS	UNIFORMITY OF PRODUCTS/ PROCESSES	GOVERNMENT ROLE	GHG MEASUREMENT / CALCULATION ISSUES	GHG ATTRIBUTION
Electricity & Heat	24.6%		–	+	–		
Transport	13.5%						
Motor Vehicle Manufacture	9.9%	+	+	+	+		
Aviation	1.6%	+	+	+		+	+
Industry	21.1%						
Chemicals	4.8%	+	–	–			+
Cement	3.8%		+	+			
Steel	3.2%	+	+	+			+
Aluminum	0.8%	+	+	+			+
Buildings	15.4%		–	–	+		
Agriculture	14.9%		–	–	–	+	
Waste	3.6%		–	+	–	+	
Land-Use Change & Forestry	18.2%			–	–	+	
Notes: Sectors shown do not comprise 100 percent of global emissions, nor are all sectors mutually exclusive. A “+” grade suggests high appropriateness or conduciveness for international sectoral cooperation. A “–” grade suggests a barrier to international sectoral cooperation. No grade means evidence is mixed, ambiguous, or not relevant.							

We hope that through the examples of existing sectoral approaches on (forests, fossil fuels, HFCs, and cities) and the applications to new areas (energy production, energy efficiency, and monitoring) that we might identify some answers to these questions such that future sectoral efforts are designed appropriately for success.

²³ Bradley et al. 2007, 3.

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