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Global Governance: The G20 and a Global Green New Deal

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Abstract As the world recovers from the worst economic crisis since the Great Depression, the international community should promote a mix of policies to sustain this global recovery and create jobs through reducing carbon dependency, ecological degradation and poverty. Such a Global Green New Deal (GGND) requires a long-term commitment to implementing and coordinating "green investments" by the Group of 20 (G20), who should also adopt complementary pricing policies and foster international aid and other actions in support of the GGND. Developing economies should provide clean water and sanitation for the poor, create safety nets, invest in heath and education, and target energy and water poverty. Such a global strategy can revive economies, create jobs and improve the sustainability of world development.

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Keywords Economic Recession; G20; global governance; Global Green New Deal; green stimulus; low-carbon economy; world economy

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A revised and updated version of the report is forthcoming as Barbier, E.B. (2010). A Global Green New Deal: Rethinking the Economic Recovery. Cambridge University Press, Cambridge, UK.

1 Introduction

In 2008, the world was confronted with multiple crises—fuel, food and financial. The result of these crises has been the worst global economic recession since the Great Depression of the 1930s. In 2009, for the first time in decades, the volume of world trade declined as global per capita income contracted (United Nations 2009; World Bank 2009). Although there are signs that the worst of the economic crisis is abating, some of its impacts are continuing to reverberate through the world economy. The International Monetary Fund (IMF) predicts that any recovery is likely to be weak, uneven and prolonged (IMF 2009). There are also concerns about rising global unemployment and poverty, especially as every 1% fall in growth in developing economies will translate into an additional 20 million people consigned to poverty (ILO 2009; World Bank 2008).

Faced with the social and economic consequences of a weak, unstable and protracted recovery, it may seem a luxury to consider policies that aim to reduce carbon dependency and environmental degradation. Such a conclusion is both false and misleading.

The multiple crises threatening the world economy today demand the same kind of initiative as shown by Roosevelt's New Deal in the 1930s, but at the global scale and embracing a wider vision. The right mix of policy actions can stimulate recovery and at the same time improve the sustainability of the world economy. If these actions are adopted, over the next few years they will create millions of jobs, improve the livelihoods of the world's poor and channel investments into dynamic economic sectors. A "Global Green New Deal" (GGND) refers to such a timely mix of polices (Barbier 2009 and 2010).

An expanded vision is critical to the lasting success of a world economic recovery. Reviving growth, ensuring financial stability and creating jobs should be essential objectives. But unless new policy initiatives also address other global challenges, such as reducing carbon dependency, protecting ecosystems and water resources and alleviating poverty, their impact on averting future crises will be short-lived. Without this expanded vision, restarting the world economy today will do little to address the imminent threats posed by climate change, energy insecurity, growing freshwater scarcity, deteriorating ecosystems, and above all, worsening global poverty. To the contrary, it is necessary to reduce carbon dependency and ecological scarcity not just because of environmental concerns but

because this is the correct and only way to revitalize the economy on a more sustained basis.

However, implementing a Global Green New Deal requires not only the right and timely mix of policies but also a new approach to global governance. Elsewhere, I have focused in more detail on the policies that could comprise such a GGND (Barbier 2009 and 2010). In this paper, I discuss a key global governance issue that could be critical for its success—the potential role of the 20 richest and largest (G20) economies in fostering international policy coordination in support of a Global Green New Deal.

The next section reviews the efforts of some G20 economies to implement "green stimulus" measures in their economic recovery packages as responses to the 2008-9 recession. Despite these efforts, such fiscal investments have failed to address the root global environmental and economic problems that make the world economy inherently unsustainable. To illustrate the scale of the global problem, the following section summarizes briefly the economic and environmental dangers posed by a return to business-as-usual growth for the world economy. Tackling these multiple crises is the central rationale for the need for a “Global” Green New Deal implemented over the next several years. The key policy elements of such a GGND are then briefly outlined. Examples are given of the type of economic policies, investments and incentives reduce carbon dependency, protect ecosystems and alleviate poverty while fostering economic recovery and creating jobs. Discussion of these initiatives provides an important lead for understanding why the G20 should be the main global forum for implementing and coordinating international policies in support of a comprehensive GGND in the coming years.

2 Green Fiscal Stimulus Measures during the 2008-9 Recession

In their communiqué at the 2 April London Summit, the leaders of the Group of 20 (G20), the world’s 20 biggest rich and emerging economies, stressed their commitment to "ensuring a fair and sustainable recovery for all" by stating: "We will make the transition towards clean, innovative, resource efficient, low carbon

technologies and infrastructure….We will identify and work together on further measures to build sustainable economies."[1]

As part of their efforts to boost aggregate demand and growth, some G20 governments adopted expansionary policies that also incorporated a sizable "green fiscal" component. Such measures included support for renewable energy, carbon capture and sequestration, energy efficiency, public transport and rail, and improving electrical grid transmission, as well as other public investments and incentives aimed at environmental protection. Several studies have shown that such "green stimulus" policies could foster a more sustainable, low-carbon economic development in the medium term while creating growth and employment in "clean energy" sectors (see, for example, Barbier 2009 and 2010; Houser et al. 2009; Pew Charitable Trusts 2009; Pollin et al. 2008; Renner et al. 2008).

Table 1 below summarizes the green stimulus investments undertaken by G20 governments in response to the 2008-9 recession.

For example, the $787 billion American Recovery and Reinvestment Act, which was implemented in the United States in February 2009, included around $78.5 billion to retrofit buildings, expand mass transit and freight rail, construct a “smart” electrical grid transmission system and expand renewable energy supply. Additional investments in water infrastructure resulted in a $94.1 billion green stimulus package. These investments amounted to 0.7% of US GDP over two years, with the target of creating around 2 million jobs.[2] South Korea also launched a national Green New Deal plan in February 2009. At a cost of $36.3 billion over 2009 to 2012, around 3% of GDP, the plan invests in low-carbon

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[1] From "London Summit-Leaders' Statement 2 April 2009", available at http://www.g20.org/pub_communiques.aspx. The members of the G20 include 19 countries (Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom and the United States) plus the European Union.

[2] In addition, the October 2008 Emergency Economic Stabilization Act in the United States also included US$185 billion in tax cuts and credits, including US$18.2 billion for investments in wind, solar and carbon capture and storage. The 2010 Federal Budget allocates an additional $9.4 billion to a high-speed rail state grant program and in further clean water investments. See Robins et al. (2009c) for further details.

Table 1: Global Stimulus Packages and Green Investments (as of July 1, 2009)[a]

	Total fiscal stimulus (US$ bn)	Green Stimulus (US$ bn)			GDP (US bn)[c]	GS as % of TS	GS as % of GDP
		Low carbon[b]	Other	Total			
Argentina	13.2				526.4	0.0%	0.0%
Australia	43.8	9.3		9.3	773.0	21.2%	1.2%
Brazil	3.6				1,849.0	0.0%	0.0%
Canada	31.8	2.5	0.3	2.8	1,271.0	8.3%	0.2%
China	647.5	175.1	41.3	216.4	7,099.0	33.4%	3.0%
France	33.7	7.1		7.1	2,075.0	21.2%	0.3%
Germany	104.8	13.8		13.8	2,807.0	13.2%	0.5%
India	13.7				2,966.0	0.0%	0.0%
Indonesia	5.9				843.7	1.7%	0.0%
Italy	103.5	1.3		1.3	1,800.0	1.3%	0.1%
Japan	639.9	36.0		36.0	4,272.0	5.6%	0.8%
Mexico	7.7	0.8		0.8	1,353.0	9.7%	0.1%
Russia	20.0				2,097.0	0.0%	0.0%
Saudi Arabia	126.8		9.5	9.5	546.0	7.5%	1.7%
South Africa	7.5	0.7	0.1	0.8	467.8	10.7%	0.2%
South Korea	38.1	14.7	21.6	36.3	1,206.0	95.2%	3.0%
Turkey					853.9		0.0%
United Kingdom	34.9	3.7	0.1	3.7	2,130.0	10.6%	0.2%
United States[d]	787.0	78.5	15.6	94.1	13,780.0	12.0%	0.7%
European Union[e]	38.8	22.8		22.8	14,430.0	58.7%	0.2%
Total G20	**2,702.2**	**366.3**	**88.4**	**454.7**	**63,145.8**	**16.8%**	**0.7%**
Total Other[d]	**314.1**	**7.6**	**1.0**	**8.6**	**6,902.9**	**2.7%**	**0.1%**
Global Total	**3,016.3**	**373.9**	**89.4**	**463.3**	**65,610.0**	**15.4%**	**0.7%**

Notes: [a]Sources for total fiscal stimulus (TS) and green stimulus (GS) investments are from Robins et al. (2009a, 2009b, 2009c) and Khatiwada (2009). "Stimulus Packages to Counter Global Economic Crisis: A review." Discussion paper. International Labour Organization (International Institute for Labour Studies), Geneva. [b]Includes support for renewable energy, carbon capture and sequestration, energy efficiency, public transport and rail, and improving electrical grid transmission. [c]Based on 2007 estimated Gross Domestic Product (GDP) in terms of purchasing power parity, from the US Central Intelligence Agency The World Factbook, available at https://www.cia.gov/library-

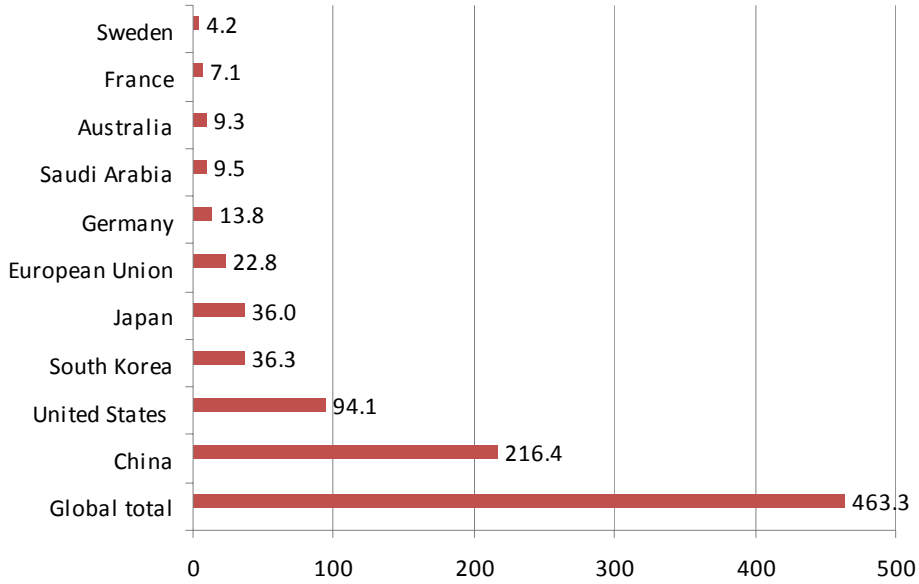
/publications/the-world-factbook/rankorder-/2001rank.html. [d]From the February 2009 American Recovery and Reinvestment Act only. The October 2008 Emergency Economic Stabilization also included US$185 billion in tax cuts and credits, including US$18.2 billion for investments in wind, solar and carbon capture and storage. [e]Only the direct contribution by the European Union (EU) is included. [f]Includes the national stimulus packages of non-G20 EU countries: Austria, Belgium, Greece, Hungary, the Netherlands, Poland, Portugal, Spain and Sweden. The non-EU countries in this group are Chile, Israel, Malaysia, New Zealand, Norway, the Philippines, Switzerland, Thailand and Vietnam.

projects, water management, recycling and ecological protection. The initiative aims to create 960,000 jobs over this period. The low-carbon projects include developing railroads and mass transit, fuel efficient vehicles and clean fuels, energy conservation and environmentally friendly buildings. These investments total 1.2% of GDP, comprise 95% of all fiscal stimulus spending, and are expected to create at least 334,000 new jobs. Over 33% of China's $647.5 billion in total stimulus spending during 2009 was for energy efficiency and environmental improvements, rail transport and new electricity grid infrastructure. The UK government devoted around 11% of its $34.9 billion fiscal stimulus to green investments, including launching in April 2009 its own "green economy" budget featuring a range of low-carbon investments aimed at creating 400,000 new jobs over the next eight years.[3]

However these initiatives fall short of a major global "green recovery" effort in response to the 2008-9 recession. As indicated in Table 1, of the nearly $3 trillion that has been spent worldwide on fiscal stimulus, over $460 billion was spent by governments on green investments. The vast majority of the green stimulus spending has been by the G20. Yet, as of July 1, 2009, of the $2.7 trillion that G20 economies committed to fiscal stimulus since the start of the global recession, only about 17% were devoted to low-carbon, energy efficiency or environmental improvement measures. In total, green stimulus investments amount to around 0.7% of the G20 GDP. In fact, as the following figures show, a comparison of countries in terms of total green stimulus spending, the share of green to

[3] For further details of these and other green stimulus initiatives of the G20, see Barbier (2009) and (2010).

Figure 1: Total Green Stimulus Spending by Country ($ billion)[a]



[a]Based on Table 1.

conventional stimulus spending, and the share of green spending in GDP, shows that the green recovery efforts in response to the recession were highly skewed.

As Figure 1 indicates, the United States and China accounted for over two thirds of the global expenditure on green fiscal stimulus over 2008-9. The world's largest economy, the European Union, has contributed substantially less to green recovery efforts. The governments of key European economies, such France, Germany, Sweden and the United Kingdom, spent much less on low-carbon and environmental investments than the major Asia-Pacific economies, Australia, Japan and South Korea. Several G20 governments have not committed any funds to green stimulus, include the large emerging market economies of Brazil, India and Russia (see Table 1).

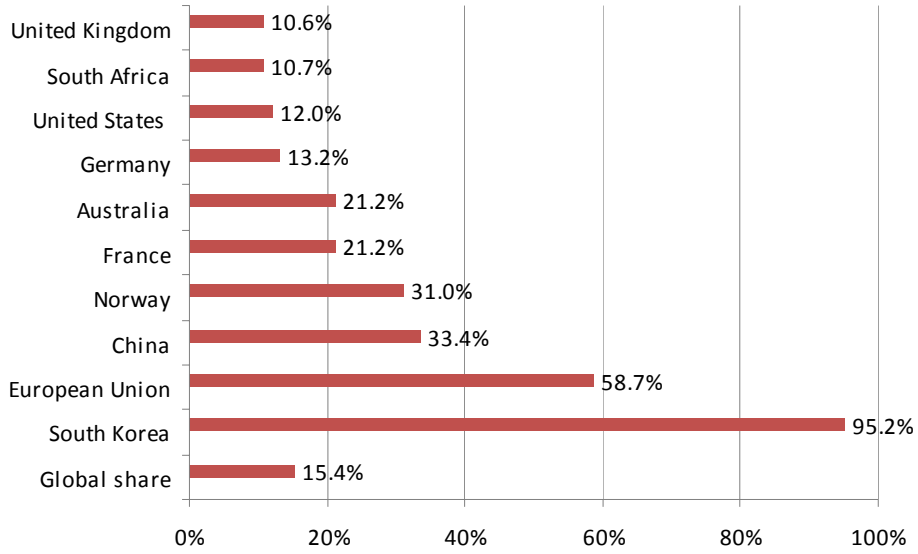
As shown in Figure 2, green stimulus measures and investments amounted globally to around 15% of all fiscal stimulus spending that occurred during the 2008-9 recession. However, only a handful of economies devoted a substantial amount of their total fiscal spending to green investments. The most notable was South Korea, whose "Green New Deal" accounted for nearly all of its fiscal

response to the global recession. China allocated around a third of its total fiscal spending to green measures. Over half of the direct contribution of the European Union to spending under the European Recovery Plan was for low-carbon investments, but as indicated in Figure 1, the overall size of this investment was relatively small. In comparison, whereas the United States made a sizable commitment to green stimulus measures in the American Recovery and Reinvestment Act, they comprised only 12% of total fiscal spending under this legislature. Overall, most G20 governments were cautious as to how much of their stimulus spending in response to the recession was allocated to low-carbon and other environmental investments.

Perhaps most revealing, however, was the share of green stimulus measures in gross domestic product (GDP) of G20 economies, as illustrated in Figure 3.

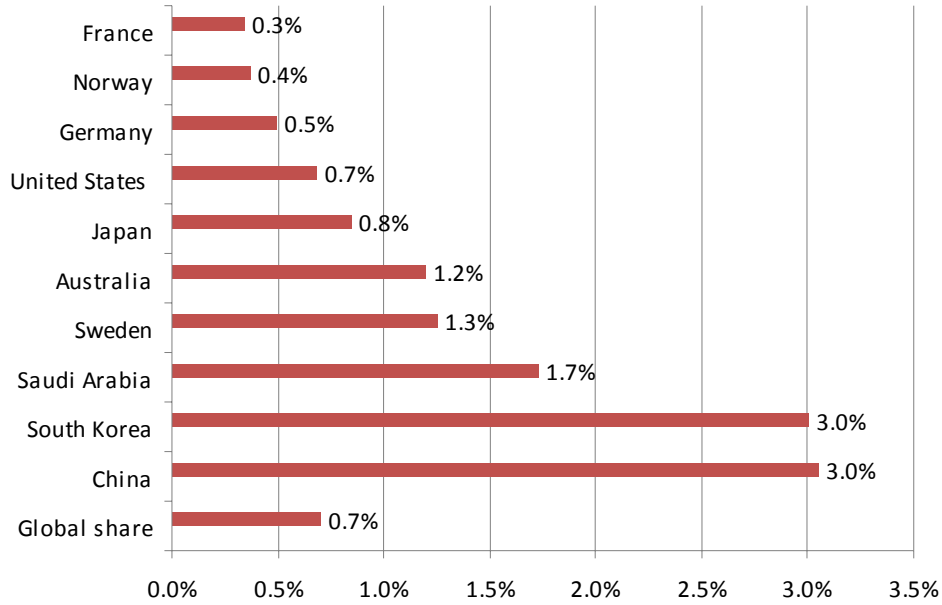
Figure 3 indicates that very few G20 governments spent more than 0.7% of GDP on low-carbon and environmental investments during the 2008-9 recession. For example, large-scale green stimulus programs such as the 3% of GDP instigated by South Korea and China were the exception rather than the norm.

Figure 2: Green Stimulus as a Share of Total Fiscal Stimulus[a]



[a]Based on Table 1.

Figure 3: Green Stimulus as a Share of Gross Domestic Product (GDP)[a]



[a]Based on Table 1.

It is therefore unlikely that the green stimulus spending by G20 governments during the 2008-9 recession amounted to a concerted global "green recovery" effort. It is also questionable whether low-carbon and other environmental investments on their own can have much impact on economies in which fossil fuel subsidies and other market distortions, as well as the lack of effective environmental pricing policies and regulations, diminish the incentives for stimulating both public and private investment in green sectors (Barbier 2010). Finally, the green stimulus spending of G20 governments during the recession was aimed at their national economies. Less effort was devoted to assisting developing economies with worsening poverty and environmental problems as a result of the global recession..

Thus, if the G20 is serious about "further measures to build sustainable economies", then it needs to adopt additional initiatives and policies towards this

goal over the next several years, as well as coordinate the timing and implementation of these measures. To understand why a more comprehensive and coordinated effort is required by the G20, the rest of this paper briefly outlines the danger posed by business-as-usual growth, the key features of a GGND and why further action by the G20 is needed to make such a GGND effective.

3 Business as Usual Growth

The indications are that, once the world economy recovers and it fails to shift from a business-as-usual-growth path, avoiding future global environmental and economic crises may be difficult.

Given the current fossil fuel dependency of the world economy, once growth resumes, the oil price could rise significantly (IEA 2008). The impact will be felt throughout the global economy, but especially by the poor. In 2008, rising fuel prices cost consumers in developing economies US$400 billion in higher energy expenditures and US$240 billion in dearer food. The accompanying rise in food prices increased global poverty by between 130 million and 155 million people (World Bank 2009). Increasing energy prices will do little to alleviate the widespread problem of global energy poverty. Billions of people in developing countries have no access to modern energy services, and those consumers who do have access often pay high prices for erratic and unreliable services. Among the energy poor are 2.4 billion people, who rely on traditional biomass fuels for cooking and heating, including 89% of the population of sub-Saharan Africa, and another 1.6 billion people who do not have access to electricity (Modi et al. 2005).

Even if demand for energy remains flat until 2030, just to offset the effect of oilfield decline the global economy will still need 45 million barrels per day of additional gross production capacity—an amount approximately equal to four times the current capacity of Saudi Arabia (IEA 2008). But with the resumption of world economic growth on a business-as-usual path, fossil fuel demand is unlikely to stay constant, despite the rise in energy prices. The International Energy Agency (IEA 2008) expects that, by 2030, global energy demand will rise by 45%. Increasing consumption of fossil fuels will worsen energy security concerns for carbon-dependent economies, such as increased concentration of the remaining oil

reserves in a fewer number of countries, the risk of oil supply disruptions, rising energy use in the transport sector, and insufficient additions of oil supply capacity to keep pace with demand growth (IEA 2007).

A world economic recovery that revives fossil fuel consumption will accelerate global climate change. With the resumption of energy demand growth, greenhouse gas (GHG) emissions will also increase by 45% to 41 gigatonnes (Gt) in 2030, with three-quarters of the rise generated by China, India and the Middle East (IEA 2008). Without a change in the carbon dependency of the global economy, the IEA (2008) warns that the atmospheric concentration of GHG could double by the end of this century, and lead to an eventual global average temperature increase of up to 6^{o}C. Such a scenario is likely to cause a sea level rise between 0.26 and 0.59 meters, and severe disrupt freshwater availability, ecosystems, food production, coastal populations and human health (IPCC 2007). According to the Stern (2007), with 5-6°C warming, the world economy could sustain losses equivalent to 5-10% of global gross domestic product (GDP), with poor countries suffering costs in excess of 10% of GDP.[4] Across all cities worldwide, about 40 million people are exposed to a 1 in 100 year extreme coastal flooding event, and by the 2070s the population exposed could rise to 150 million (Nicholls et al. 2007).[5]

The world's poor are especially vulnerable to the climate-driven risks posed by rising sea level, coastal erosion and more frequent storms. Around 14% of the population and 21% of urban dwellers in developing countries live in low elevation coastal zones that are exposed to these risks (McGranahan et al. 2007). The livelihoods of billions—from poor farmers to urban slum dwellers—are threatened by a wide range of climate-induced risks that affect food security, water availability, natural disasters, ecosystem stability and human health (OECD 2008; UNDP 2008; Sukhdev 2008).

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4 Although the estimates of the economic damages of climate change by Stern (2007) are widely cited, as Tol (2008) has shown, any such estimates are affects by the choice of discount rate and equity weights, and are subject to large uncertainties. Tol (2008) finds that the estimates by Stern (2007) are highly pessimistic, even compared to other studies that employ low discount rates on future damages.

5 The top ten cities in terms of exposed population are Mumbai, Guangzhou, Shanghai, Miami, Ho Chi Minh City, Kolkata, Greater New York, Osaka-Kobe, Alexandria and New Orleans.

Global ecosystems and freshwater sources are also endangered by an economic recovery that ignores environmental degradation. Over the past 50 years, ecosystems have been modified more rapidly and extensively than in any comparable period in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel. The result has been a substantial and largely irreversible loss in biological diversity. Approximately 15 out of 24 major global ecosystem services have been degraded or used unsustainably, including freshwater, capture fisheries, air and water purification, and the regulation of regional and local climate, natural hazards, and pests (MA 2005).

Poor people in developing countries are most affected by the continuing loss of critical ecological services. Nearly 1.3 billion people in developing economies—over a fifth of the world's population—live on lands prone to degradation and water stress or in upland areas, forest systems, drylands and similar fragile environments. Almost half of this population (613 million) consists of the rural poor (World Bank 2003: 59; IWMI 2007). For the world's poor, global water scarcity manifests itself as a water poverty problem. One in five people in the developing world lacks access to sufficient clean water, and about half the developing world's population, 2.6 billion people, do not have access to basic sanitation. More than 660 million of the people without sanitation live on less than US$2 a day, and more than 385 million on less than US$1 a day (UNDP 2006).

Even before the current global economic crisis, it was estimated that, by 2015, there will be nearly 1 billion people living on less than US$1 a day and almost 3 billion living on less than US$2 a day.[6] As noted above, the 2008-9 recession is likely to have increased these numbers significantly. But a world economic recovery program that does not also address directly the problems of energy and water poverty, climate change and ecological risks will have little impact on improving the livelihoods of the poor.

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[6] Based on projections to 2015 of the share of world population living on US$1 a day and US$2 a day in (ILO 2004) and 2015 mid-level projections of world population from PDUN (2006).

4 A Global Green New Deal

If the multiple crises arising from a business-as-usual growth path are to be avoided, then the international community must consider a major rethinking of how it wants to achieve a sustained global economic recovery from the 2008-9 recession. What is needed is the same kind of initiative as shown by Roosevelt's New Deal in the 1930s, but at the global scale and embracing a wider vision. Without such an expanded vision, restarting the world economy today will do little to address the imminent threats posed by climate change, energy insecurity, growing freshwater scarcity, deteriorating ecosystems, and above all, worsening global poverty. In contrast, the right mix of policy actions can stimulate recovery and at the same time improve the sustainability of the world economy. If these actions are adopted, over the coming years they will create millions of jobs, improve the livelihoods of the world's poor and channel investments into dynamic economic sectors. A "Global Green New Deal" refers to such a timely mix of polices (Barbier 2009).

A Global Green New Deal (GGND) must therefore have three principal objectives:

- Revive the world economy, create employment opportunities and protect vulnerable groups.
- Reduce carbon dependency, ecosystem degradation and water scarcity.
- Further the Millennium Development Goal of ending extreme world poverty by 2025.[7]

To achieve these objectives will require both national actions by governments as well as global coordination of these efforts and additional international actions. Such a worldwide policy initiative is urgently needed. As noted above in Section 2, the green stimulus initiatives of some G20 economies in response to the 2008-9 recession was a promising start, but they do not own their own comprise a GGND. However, a concerted global effort led by the G20 could achieve such a GGND over the next several years. The rest of this section outlines some of the policy

[7] The original goal set by the United Nations was 2015, but given the current global recession and its impacts on world poverty outlined above, a more realistic deadline is 2025.

actions required in key areas of the world economy. The final part of the paper discusses an expanded global governance role for the G20.

Reducing Carbon Dependency

In high income and large emerging market economies, comprehensive policies to improve energy efficiency and conservation, expand clean energy supply options and improve the sustainability of transport can create a substantial number of jobs and boost important economic sectors in the short term. The green initiatives incorporated in the fiscal stimulus spending over 2008-9 by China, the United States, South Korea and a handful of other G20 economies illustrate a growing interest in enhancing economic recovery through such a low-carbon strategy. However, to make the proposed initiatives fully effective requires adopting complementary carbon pricing policies, which should include removing perverse subsidies and other distortions in energy markets.

For example, the low-carbon investments included in the $787 billion American Recovery and Reinvestment Act of the Obama Administration targets four energy efficiency and renewable energy areas:

- Retrofitting buildings to improve energy efficiency
- Expanding mass transit and freight rail
- Constructing a “smart” electrical grid transmission system
- Developing renewable energy, i.e. wind power, solar power, next-generation biofuels and other bio-based energy.

A study by the Peterson Institute of International Economics and the World Resources Institute (Houser et al. 2009) reveals that every $1 billion invested by the US green stimulus plan will generate energy savings of $450 million per year, reduce annual GHG emissions by 592,600 tons by 2020, and lead to approximately 30,000 job-years—a 20% increase in job creation over more traditional fiscal stimulus measures such as income tax cuts or road building. It has been estimated that such investments could create up to 2 million jobs across the United States (Pollin et al. 2008). A similar program to expand energy conservation and renewable energy supply in the European Union (EU) could create 1 to 2 million new, full-time jobs (Renner et al. 2008). Investments in mass transit systems also

have significant direct employment effects and reduce transport costs for poor households. Expanding public urban transit can create 2.5 to 4.1 secondary manufacturing jobs per direct job created. In China, the low-carbon stimulus provided by the government was motivated by the fact that its renewable energy sector already has a value of nearly U$17 billion and already employs close to 1 million workers (Renner et al. 2008). Further investments in the renewable energy sector and other "clean technologies" could have a major impact on developing new economic growth, expanding exports, and creating employment.

But perhaps the most ambitious low-carbon strategy was contained in South Korea's Green New Deal (see Table 2). At a cost of around U$36 billion over 2009 to 2012, the initiative aims to create 960,000 jobs. The low-carbon projects include developing railroads and mass transit, fuel efficient vehicles and clean fuels, energy conservation and environmentally friendly buildings. These measures alone will account for over 1.2% of GDP, whereas the full GND plan involves investments of around 3% of GDP.[8]

Stimulus investments in low-carbon energy by G20 governments are important components of a GGND, but the employment and economic gains would be enhanced further by complementary carbon pricing incentives, removal of perverse fossil fuel subsidies and appropriate environmental regulations. Such a comprehensive set of policies, coordinated and led by the G20 nations, could form the basis of an expanded strategy of international green recovery policies.[9]

For example, it is been argued that most of the costs of the $78.5 billion low-carbon program in American Recovery and Reinvestment Act could be recouped with proceeds from auctions under a greenhouse gas cap-and-trade program and the elimination of fossil fuel subsidies and tax breaks (Pollin et al. 2008). Removal of fossil fuel subsidies eliminates perverse incentives in energy markets and provides an immediate source of financing for low-carbon strategies. Globally around US$300 billion annually, or 0.7% of world GDP, is spent on such subsidies, which are employed mainly to lower the prices of coal, electricity, natural gas and oil products (UNEP 2008). Most of these subsidies do not benefit

[8]The source of this information and table is from a "Briefing Note for Foreign Correspondents", Ministry of Strategy and Finance, Government of South Korea. January 19, 2009.

[9] For further details, on how an expanded strategy of international green recovery policies could comprise a "Global Green New Deal", see Barbier (2009) and (2010).

Table 2: The South Korean Green New Deal

Project	**Employment**	**US$ million**
Expanding mass transit and railroads	138,067	7,005
Energy conservation (villages and schools)	170,702	5,841
Fuel efficient vehicles and clean energy	14,348	1,489
Environmentally friendly living space	10,789	351
River restoration	199,960	10,505
Forest restoration	133,630	1,754
Water resource management (small and midsize dams)	16,132	684
Resource recycling (including fuel from waste)	16,196	675
National green information (GIS) infrastructure	3,120	270
Total for the nine major projects	**702,944**	**28,573**
Total for the Green New Deal	**960,000**	**36,280**

Source: Ministry of Strategy and Finance, Government of South Korea.

the poor but the wealthy, nor do they yield widespread economic benefits. Energy subsidies in the high income economies of the Organization for Economic Cooperation and Development (OECD) amount to about US$80 billion annually, and subsidies in 20 non-OECD countries total US$220 billion. Cancelling these subsidies would on their own reduce greenhouse gas emissions globally by as much as 6% and add 0.1% to world GDP. The financial savings could also be redirected to investments in clean energy R&D, renewable energy development and energy conservation, which would further boost economies and employment opportunities.

Eliminating fossil fuel subsidies can also benefit low-income economies. For example, energy sector reforms in Botswana, Ghana, Honduras, India, Indonesia, Nepal and Senegal have proven to be effective in leading a transition to more efficient and cleaner fuels that particularly benefit poor households. The economic and employment gains for developing economies of a wide range of low-carbon policies could be significant. Every US$1 invested in improving the energy efficiency of electricity generation can save more than US$3 in investment costs in low and middle income countries, because current efficiency levels are currently

much lower in these economies (ESCAP 2008). Small hydropower, biomass and solar photovoltaics (PV) already provide electricity, heat, water pumping and other power for tens of millions of people in rural areas of developing countries. 25 million households depend on biogas for cooking and lighting, and 2.5 million household use solar lighting systems. Developing economies currently account for 40% of existing global renewable resource capacity, 70% of solar water heating capacity and 45% of biofuels production (REN21 2008). Expansion of these sectors will not only increase the availability of affordable and sustainable energy services for the world's poor but also provide much needed employment opportunities in developing economies. As Grameen Shakti in Bangladesh has demonstrated, it is possible to disseminate PV solar home systems, biogas facilities and improved cooking stoves to over 200,000 poor households and generate thousands of jobs (Barbier 2010: Box 9).

Low-carbon strategies in the transport sector that target the next generation of biofuels, develop fuel-efficient motor vehicles and expand urban public transit and rail networks also have the potential to stimulate growth and create jobs. More than 3.8 million jobs could be created globally through the production of vehicles with high fuel efficiency, hybrid and alternative fuel use and low emission technologies, and up to 19 million additional ancillary jobs worldwide in fuel refining and distribution, sales, repairs and services. At least 1.2 million jobs are involved worldwide in biofuel production, but global expansion of next generation feedstocks could easily yield 10 million jobs or more. Mass transit systems have significant direct employment impacts globally, accounting for 367,000 workers in the United States and 900,000 in the European Union alone. Investment in public urban transit has also had major secondary employment effects, with a multiplier of 2.5 to 4.1 per direct job created. In the United Sates, a 10-year federal investment program in new high-speed rail systems has the employment potential of 250,000 new jobs. In South Korea, US$7 billion invested in mass transit and railways over the next three years is expected to create 138,000 jobs.[10]

However, enhancing the economic, environmental and employment gains from a sustainable transportation strategy will require the removal of perverse incentives and the implementation of market-based instruments and regulations. Removal of transport market and planning distortions would contribute to less economic waste,

[10] The sources for this paragraph are the various studies cited in Barbier (2010: Boxes 10-12).

reduce pollution and congestion, foster greater transport choice and facilitate sustainable transport strategies that would boost economic recovery and employment. Fiscal policies, such as fuel and vehicle taxes, new vehicle incentives, road fees, user fees, vehicle insurance and fleet vehicle incentives, can have powerful impacts on encouraging the introduction of cleaner, fuel-efficient vehicles. Combining these policies with regulatory measures, such as more stringent greenhouse gas and fuel economy standards, may produce the most important shifts in vehicle demand and use. Such policies are proving increasingly attractive not only to high-income OECD economies but also to large emerging market economies, such as China and India (Barbier 2010: Box 13).

Reducing Ecological Scarcity and Poverty

There is a link between reducing ecological scarcity and improving the livelihoods of the poor. Ecological scarcity is the loss of myriad ecosystem benefits, or "services", as these systems are exploited for human use and economic activity (Barbier 1989:96-97). As noted previously, this scarcity problem is accelerating on a global scale, and is manifesting itself in the loss of many ecosystem services that are vital to the poor. As the world economic crisis deepens and expands to affect the developing world, it is the poor who are most vulnerable to the consequences, and increasing ecological scarcity adds further to this burden. Thus, a GGND must also tackle urgently the problem of extreme world poverty caused by rising ecological scarcity, as well as implement measures that more directly reduce the vulnerability of the world's poor.

This objective can be accomplished through several pathways.

Most developing economies and the majority of their populations depend directly on exploiting natural resources (Barbier 2005, 2008). For the foreseeable future, primary product exports will remain the main source of export earnings and savings that will facilitate the foreign direct investment, domestic private and public investment and international borrowing necessary for financing economic development. Ensuring sustainable income from primary production is not only essential for generating the necessary savings and revenues in the long run but also important to guarantee that sufficient financial flows are available for investment in the physical capital, infrastructure, skills, health services and educational opportunities necessary for long-term development. Encouraging more primary

production from a country's natural resource endowment is not truly sustainable, however, unless it also alleviates the persistence of widespread poverty, especially rural poverty, and improves the economic livelihoods of the large numbers of people concentrated in fragile, resource-poor environments.

Reducing poverty in developing economies therefore requires:

- Policies, investments and reforms to enhance the sustainable and efficient use of natural resources and production processes dependent on them.
- Ensuring that the financial returns from more sustainable activities are re-invested in the industrial activities, infrastructure, health services, and the education and skills necessary for long-term economic development.
- Targeting investments and other policy measures to improving the livelihoods of the rural poor, especially those living in fragile environments.
- Protecting and improving the provision of ecosystem services on which the extreme poor depend.

Before the current economic crisis, three resource-dependent developing economies have shown progress with the first two objectives: Malaysia, Thailand and Botswana (Barbier 2005). All three countries managed to achieve a long-term investment rate exceeding 25% of GDP and long-run average annual growth rates exceeding 4%, which are investment and growth rates comparable to that of high income economies. Malaysia and Thailand have successfully diversified their economies through re-investing the financial gains from primary production for export. Botswana is a mineral-rich economy that developed favorable institutions and policies for managing its natural wealth and primary production for extensive economy-wide benefits.

Asking national governments of developing economies to implement policies, reforms and investments to improve the sustainability of primary production seems a tall order, given how much their economies were affected by the 2008-9 crisis. However, as argued by the World Bank, such a strategy is even more vital for resource-dependent developing economies during a worldwide recession in which private investment flows and trade has declined (World Bank 2008). The main policy priorities should be improving the sustainability of primary production activities, with the aim of ensuring that they generate sufficient investible funds

for diversifying the economy, building up human capital, and investing in social safety nets and other investments targeted at the poor. In addition, the failure to implement such policies worsens extreme poverty in developing economies worse and raises the costs of implementing these measures once economic conditions improve.

There are two ways in which a GGND can improve the livelihoods of the poor.

The *first* is to provide financing directly, through involving the poor in payment for ecosystem services schemes and other measures that enhance the environments on which the poor depend. Payments for the conservation of standing forests or wildlife habitat are the most frequent type of compensation programs used currently in developing countries, and they have been mainly aimed at paying landowners for the opportunity costs of preserving natural landscapes that provide one or more diverse services: carbon sequestration, watershed protection, biodiversity benefits, wildlife protection and landscape beauty (Alix-Garcia et al. 2008; Barbier 2008; Bulte et al. 2008; Grieg-Gran et al. 2005; Pagiola et al. 2005; Wunder 2008; Zilberman et al. 2008). Wherever possible, the payment schemes should be designed to increase the participation of the poor, to reduce any negative impacts on nonparticipants while creating additional job opportunities for rural workers, and to provide technical assistance, access to inputs, credit and other support to encourage poor smallholders to adopt the desired land use practices. More effort must be devoted to designing projects and programs that include the direct participation of the landless and near landless.

The *second* is to target investments directly to improving the livelihoods of the rural poor, thus reducing their dependence on exploiting environmental resources. For example, in Ecuador, Madagascar and Cambodia poverty maps have been developed to target public investments to geographically defined sub-groups of the population according to their relative poverty status, which could substantially improve the performance of the programs in term of poverty alleviation (Elbers et al. 2007). A World Bank study that examined 122 targeted programs in 48 developing countries confirms their effectiveness in reducing poverty, if they are designed properly (Coady et al. 2004).

Targeting the poor is even more urgent during major economic crises (Development Research Group 2008; Ravallion 2008). Under-investment in human capital and lack of access to financial credit are persistent problems for the extreme poor, especially in fragile environments. Low income households

generate insufficient savings, suffer chronic indebtedness and rely on informal credit markets with high short-term interest rates. Two types of policies and investment programs targeted to the poor are essential in these circumstances (Barbier 2010). The first is a comprehensive and targeted safety net that adequately insures the poor in time of crisis. The second is the maintenance, and if possible expansion, of long-term educational and health services targeted at the poor. Unfortunately, during financial and economic crises, publicly funded health and education services are often the first expenditures reduced by developing country governments.

Reducing Water Scarcity

If a Global Green New Deal is to have a lasting impact on reducing worldwide poverty and at the same time ensure that the ensuing global economic recovery is sustainable, then the GGND must also include policy measures to address another looming global ecological scarcity problem—the emerging water crisis. There are two aspects of this emerging water crisis: the worldwide scarcity of freshwater supplies relative to increasing demand, and the lack of clean water and sanitation available for millions of the poor in developing regions.

There is a consensus that growing scarcity and competition for water are major threats to poverty alleviation, especially in the rural areas of developing economies, or as UN-Water (2007) states, "first and foremost, water scarcity is an issue of poverty." In many economies, including high-income countries, freshwater is routinely wasted and inefficiently used because of considerable distortions and disincentives in the way in which water is allocated. The problem is particularly serious in irrigated agriculture, which uses about 70 to 90% of the world's freshwater supplies. A further complication in water management is that many of the world's important river basins and other major sources of freshwater cross international boundaries.

A Global Green New Deal implemented over the next several years should aim to improve water management worldwide, and at the same time contribute to the goal of providing water services to the poor.

Reducing global water scarcity therefore requires:

- Targeting investments and other policy measures to improve the supply of clean water and sanitation services to the poor.

- Removing subsidies and other incentive distortions and implementing, where appropriate, market-based instruments and other measures to improve the efficiency of water delivery and utilization and to manage water demand.
- Facilitating transboundary water governance and cooperation over shared management and use.

A top priority of the GGND must be to revive the necessary investments to attain the Millennium Development Goal of halving, by 2015, the proportion of people in the world without sustainable access to safe drinking water and basic sanitation. The total economic benefits of the global investment in achieving the MDG would amount to about $38 billion annually (UNDP 2006). The benefits for Sub-Saharan Africa alone would amount to $15 billion annually, which equals approximately 60% of the continent's current aid flows. Other benefits include around 1 million children's lives saved over the next decade as the investments are made, averaging 203,000 fewer child deaths per year by 2015. In addition, there would be 272 million days gained in school attendance as a result of reduced illness from diarrhoea alone. Poor households would also benefit from the income gains from the reduced number of days spent ill, the money savings from less health service use and expenditures on medicines, and the increase time spent on income and productive activities of the household. Across all developing countries, when such wider benefits are included, the return on US$1 invested in clean water and sanitation interventions ranged from US$5 to US$11, and from US$5 to US$28 for some low-cost interventions.

In addition, removing water subsidies and other incentive distortions, adopting market-based instruments and implementing other measure to increase the efficiency of water allocation should be seriously considered by all economies, rich and poor.[11] Improving transboundary water governance and cooperation over shared management and use must also be an important objective of the GGND.

[11] As discussed in more detail in Barbier (2010: Box 24), active water markets are emerging in Australia, Canada and the United States, but also in Brazil, China, Chile, Mexico, Morocco, South Africa and Turkey, as well as in many other countries and regions.

Challenges Facing Developing Economies

Reducing carbon dependency and ecological scarcity through a GGND poses a number of challenges for low and middle income economies, however.

For example, many developing economies face a serious "capital gap" in private and public financial investments that will constrain them from implementing the proposed GGND. Equally limiting is the "skills and technological gap". Most developing economies, with the possible exception of Brazil, China, India, Russia and other large emerging market economies, do not have the research and development (R&D) capacity or the skilled workforce to import and adapt the new skills and technology for many of the proposed investments. Both of these gaps can be overcome by increased financing, but during the current global economic crisis, new financial flows are in short supply. Potential aid flows from donors are likely to be reduced and not increased. The crisis has already curtailed private investment flows, especially to more risky investments with longer term returns. The political will to develop new and innovative financial mechanisms to spur global investments may also weaken.

Trade is an important incentive for some actions proposed under the GGND, but as discussed previously, global trade is projected to decline over 2009 and remain sluggish for the foreseeable future. International commodity prices have also been highly volatile, especially for energy and food, with prices first rising and then falling sharply as the global recession has deepened. Developing economies, particularly those who are highly resource dependent, face balance of payment problems and uncertainty over export and government revenues. Under such conditions it is difficult to implement investments and reforms, such as those required to improve the sustainability of primary production activities, increase health and educational expenditures, develop comprehensive safety net programs targeted at the poor and finance clean energy and transport technologies. The current economic climate also deters the progress needed in the Doha Round of world trade negotiations to support the GGND.

There are also a number of failures in current global governance that may inhibit a GGND. In the absence of a post-Kyoto climate change agreement, there is growing investment uncertainty over the future of the global carbon market and the Clean Development Mechanism (CDM) after 2012. Future Joint Implementation (JI) projects may also be affected. Both uncertainty over future global climate policy and the delay caused by inaction increase sharply the costs of

an agreement (Bosetti et al. 2008). Delay in adopting effective climate policies will affect the cost of future agreements that will be required to abate an even larger amount of emissions. Such inaction in the short term increases significantly the costs of compliance in the long term, which is compounded by the effects of uncertainty on investment and policy decisions. Scaling up and reforming the CDM, increasing its coverage of countries to more low-income and Sub-Saharan economies and including more sectors and technologies in the mechanism should also be priorities.

New trade and financial mechanisms are required, and international agreements on transboundary pollution and water management need to be negotiated, as important complements to a GGND. In addition, aid shortfalls seriously limit some of the key GGND measures proposed for developing economies.

Even before the 2008-9 recession, not only had overall development assistance to poor countries fallen in real terms over the previous decade, but the share of assistance to the water and sanitation sector of developing economies declined even more. For example, in its 2006 report on water, the UNDP estimated that the sector accounted for less than 5% of development assistance, and aid flows would need to double to bring the MDG within reach, rising by US$3.6 to US$4 billion annually (UNDP 2006). With the 2008-9 recession and the fall in revenues of national governments, addressing the gap in overseas aid for clean water and sanitation in developing economies needs to be a priority of the international community under a GGND.

As a result of the food and fuel crises preceding the 2008-9 recession, the number of extremely poor was estimated to have increased by at least 100 million. Many of those already poor slipped even more deeply into poverty; for instance, 88% of the recent increase in extreme urban poverty arose from poor households becoming poorer and only 12% from households falling into poverty. Because of these impacts, the annual cost of lifting the incomes of all of the poor to the poverty line rose by $38 billion or 0.5 percent of developing country GDP (World Bank 2008, 2009). Because the 2008-9 recession has undoubtedly exacerbated this worldwide problem of poverty, the President of the World Bank, Robert Zoellick (2009), has called for every high-income economy to pledge 0.7% of its stimulus package to a global “vulnerability fund” that would be used to finance in developing economies a comprehensive and targeted safety net for the poor,

investments in infrastructure including low-carbon technology projects and support for small and medium-sized enterprises and micro-finance institutions. Similarly, the UN High Level Task Force on the Global Food Crisis (2008) recommended that donor countries double financing for food assistance, other types of nutritional support and safety net programs, and that the percentage of aid to be invested in food and agricultural development should be increased from the current 3 % to 10% within five years.

5 Global Governance and the G20

Improving global governance is crucial to meeting the financial, trade and policy coordination challenges to implementing the Global Green New Deal over the next several years. Although the entire international community, and especially the UN system, should be involved in promoting, developing and enhancing a sustainable global recovery, the most likely policy forum for leading international action on the GGND is the Group of 20 largest rich and emerging economies.

There are several reasons why the G20 is the appropriate body for coordinating and innovating international policy in support of the GGND.

First, the G20 quickly emerged as the global forum for coordinating policy action during the 2008-9 economic crisis. For example, the London G20 meeting on 2 April 2009 was "a sincere attempt by the leaders of the G20 countries to come up with a multilateral and coherent set of proposals to deal with the problems that the world economy is facing" (Bird 2009:157). At the April meeting, the G20 demonstrated its new global governance ability by promoting the International Monetary Fund (IMF) to a lead role in the current world recession, by tripling its lending capacity, allocating more resources to the IMF and endorsing recent institutional changes to its facilities. By the 24-25 September 2009 summit in Pittsburgh, the G20 leaders acknowledged their new responsibility for coordinating policies for a global economic recovery: "We designated the G-20 to be the premier forum for our international economic cooperation."[12] Thus, the

[12] From the "Leaders' Statement, The Pittsburgh Summit, September 24-25 2009", available at http://www.g20.org/pub_communiques.aspx.

G20 has demonstrated that it has the capability to turn into action the promise made in its London communiqué that: "We will identify and work together on further measures to build sustainable economies."

Second, coordinated action by G20 economies would have a profound effect on "greening" the world economic recovery. The G20 economies together account for almost 80% of the world's population, 90% of global gross domestic product (GDP), and at least three quarters of global GHG emissions (Barbier 2010). The lead economies in the G20 are also the dominant sources of international aid, including funding of multilateral institutions. If the G20 leads the coordination and innovation in international policy required for support of the GGND, it would be an important message to the rest of the world that this strategy is critical for reviving the world economy and addressing pressing global challenges.

There are two ways, in particular, that concerted policy action by the G20 could signal its commitment to greening the global economic recovery.

One signal would be if all G20 governments would follow the lead of South Korea, China and a handful of other economies and invest at least 1% of their GDP over the next several years in reducing carbon dependency (see Figure 3). The total amount spent would amount to about one quarter of the nearly $3 trillion in G20 stimulus investments to date (see Table 1). If the G20 economies coordinated the timing and implementation of these investments globally, the overall impact on moving the world economy to a low-carbon recovery path would be boosted.

The second signal would be if the G20 also instigated pricing and regulatory reforms for reducing carbon dependency, including removing perverse subsidies and other distortions in energy, transport and similar markets. One quick way in which this could be achieved is through tackling fossil fuel subsidies. As noted above, globally around US$300 billion annually, or 0.7% of world GDP, is spent on fossil fuel subsidies. Over two thirds of these subsidies occur in G20 economies, which could coordinate their phased removal. Cancelling these subsidies could reduce GHG emissions globally by 6% and add 0.1% to world GDP (UNEP 2008). The financial savings could be redirected to investments in clean and renewable energy R&D and energy conservation, further boosting economies and employment opportunities.

Finally, as the dominant sources of international aid and funding of multilateral institutions, the G20 could mobilize international policy in support of the GGND.

For example, the G20 could secure a post-Kyoto global climate change framework. Both uncertainty over future global climate policy and the delay caused by inaction increase sharply the costs of an agreement to reduce global GHG emissions. The expiration of the Kyoto agreement in 2012 also increases the risks to global financing of carbon-reducing projects and clean energy investments in developing economies.

Any new climate change agreement must also include developing economies, especially those countries whose emissions are expected to rise rapidly in coming years (Barbier 2010:Box 3). The longer participation of developing economies in a global agreement is delayed, the higher the costs of an agreement, and the less efficient it is in reducing global GHG emissions. Various policy frameworks have been proposed, with the general consensus being that a more flexible framework is likely to work the best in accommodating developing economies, such as China, Russia and other large emerging economies.[13] As these key developing economies are already part of the G20, it makes this international forum ideal for initiating negotiations towards a comprehensive framework on a climate change agreement.

A major problem for financing many of the initiatives outlined in the GGND is the shortfall in development assistance, especially in those sectors that are the key targets of the global strategy. As the dominant sources of international aid, including funding of multilateral institutions, the G20 economies could help mobilize the international assistance required for support of the GGND

Even before the 2008-9 recession, official development assistance contributed US$5.4 billion annually to energy projects worldwide, which is below the estimated US$8.3 billion in annual low-carbon energy investments needed just for the Asia-Pacific region and the $30 billion required for all developing regions (ESCAP 2008; Wheeler 2008). Across all developing countries, total development assistance in transport amounts to US$8.2 billion, which represents just 4% of the US$211 billion total investment in the transport sector of developing economies

[13]Discussing these various post-Kyoto climate frameworks is beyond the scope of the current paper. See Aldy and Stavins (2007); Aldy et al. (2009); Barrett (2009); Hepburn and Stern (2008); Nordhaus (2007); and Wheeler (2008).

today. Yet, the United Nations Framework Convention on Climate Change (UNFCCC 2007) recommends that nearly $15 billion in development assistance is required by developing countries if they are to adopt hybrid and alternative fuel vehicles, improve the efficiency of all motorized transport and develop second-generation biofuels. To adapt to the impacts of climate change, developing countries are estimated to need around $15 to $30 billion in additional development assistance from 2010 to 2020 (Project Catalyst 2009). Shortfalls in development assistance will also impose a severe handicap on the necessary improvements in the sustainability of primary production in developing economies. Similarly, the water and sanitation sector in 2006 accounted for less than 5% of development assistance, yet aid flows would need to double, rising by US$3.6 to US$4 billion annually to bring within reach the MDG of halving the proportion of the population without these services by 2015 (UNDP 2006).

These estimates in the gap in development assistance are sobering, as no doubt the situation has worsened because of the 2008-9 global recession. However, there is some positive news.

Because of the 2008-9 economic crisis, the World Bank is planning to step up its development assistance.[14] Over the next three years, the Bank could make new commitments of up to US$100 billion. Lending could almost triple to more than US$35 billion a year compared to US$13.5 billion lent in 2008. The Bank is also creating a financial crisis facility to fast-track funds to developing countries. The new facility will expedite approval processes for money from a US$42 billion fund aimed at the world's poorest economies. An initial US$2 billion from this fund is being expedited to these countries, and the money is likely to support public spending on infrastructure, education, health, and social safety net programs, such as school and maternal feeding programs. Such increased support is consistent with the GGND strategy of improving the livelihoods of the poor affected by the 2008-9 recession.

More lending and development institutions should follow the lead of the World Bank and not only increase their aid to the poorest economies over the next few years but also target it to the poor living within these economies. As mention in the previous section, two priority areas that the G20 should focus on are:

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[14] This information on World Bank Group lending plans is from the official website http://www.worldbank.org/html/extdr/financialcrisis/.

- A global "vulnerability fund", as proposed by Zoellick (2009), that would be used to finance in developing economies a comprehensive and targeted safety net for the poor, investments in infrastructure including low-carbon technology projects and support for small and medium-sized enterprises and micro-finance institutions.
- Financing for food assistance, other types of nutritional support and an increase in the percentage of aid to be invested in food and agricultural development from the current 3 % to 10% within five years, as recommended by the UN High Level Task Force on the Global Food Crisis (2008).

In response to such efforts by the G20, developing economies could also show their commitment to a GGND by spending at least 1% of their GDP on investments for improving clean water and sanitation for the poor, as recommended by the UNDP (2006). They should also develop urgently comprehensive, well-targeted safety net programs and maintain, if not expand, educational and health services for the poor. As discussed previously, the economic and employment gains for developing economies of adopting a wide range of low-carbon policies could also be significant, especially through improvements in the efficiency of electricity generation, expanding renewable energy capacity and providing affordable and sustainable energy services for the poor. Developing economies should also instigate complementary pricing reforms in their energy, transport and water sectors, including the removal of perverse subsidies and other market distortions as well as implementing market-based instruments and improved regulations.

6 Final Remarks

A Global Green New Deal, if implemented effectively and swiftly over the next few years, has the potential to revive the world economy and reduce its vulnerability to repeated fuel and food crises as well as climate-induced risks. Other national and international actions could be incorporated into a GGND to strengthen and extend it (Barbier 2010). The strategy outlined here demonstrates how the correct mix of economic policies, investments and incentives can reduce

carbon dependency, protect ecosystems and alleviate poverty while fostering economic recovery and creating jobs.

However, improved global governance is critical for such a strategy to have a significant and lasting impact on the world economy. The paper has argued that the global forum comprising the twenty largest economies of the world—the G20—should step up and provide such a leadership role. Already, there are signs that the G20 has accepted a wider role in coordinating world economic policy, as a response to the 2008-9 global recession. What remains to be seen, however, is whether the G20 is willing to expand this role into a stronger commitment towards a comprehensive Global Green New Deal strategy, as outlined in this paper.

Currently, the signs are mixed. As Robins et al. (2009c) suggest, based on the results of the 2 April 2009 summit in London, the G20 economic strategy should be judged as "pale green". The London communiqué endorsed the need for coordinated action "to build an inclusive, green and sustainable recovery", and several G20 governments soon after the summit, such as Australia, Japan and the United Kingdom, launched additional green stimulus plans. At the September 2009 Pittsburgh summit, the G20 leaders called on the World Bank to develop a new trust fund to improve food security in low-income economies and agreed to phase out and rationalize over the medium term inefficient fossil fuel subsidies while targeting aid to the poor.[15] But, the G20 has yet to demonstrate the type of coordinated effort towards promoting urgent international action on the type of comprehensive GGND as outlined here.

It is imperative and urgent that the G20 is willing to take on this wider global governance role. The various green stimulus initiatives undertaken by some G20 governments are laudable, but these investments alone will fail to address the root global environmental and economic problems that make the world economy inherently unsustainable.

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[15] From the "Leaders' Statement, The Pittsburgh Summit, September 24-25 2009", available at http://www.g20.org/pub_communiques.aspx.

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