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NORWAY'S PROPOSAL TO AUCTION ASSIGNED AMOUNT UNITS: IMPLEMENTATION OPTIONS

THE CENTER FOR CLEAN AIR POLICY

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This paper was authored principally by William Whitesell, Research Director, and Anmol Vanamali, International Policy Analyst, the Center for Clean Air Policy (CCAP). CCAP is grateful for the support for this work provided by the Government of Norway.

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Preface

For the Government of Norway, the development of predictable and additional mechanisms for financing climate programs is a policy priority in the United Nations Framework Convention on Climate Change (UNFCCC).

Norway has proposed a system for financing based on international auctioning of allowances. We believe that such a system would complement the traditional pledge-based financing system in an efficient manner by generating significant and predictable financial resources. An auction-based financing system would also ensure adherence to the principle that the polluter should pay.

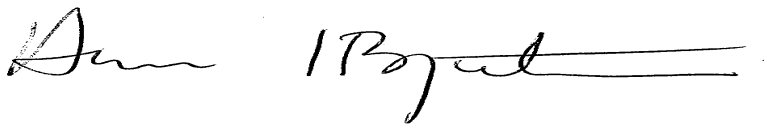
Due to the interest that the Norwegian proposal has received, the Government of Norway asked the Center for Clean Air Policy (CCAP) to produce a pragmatic, fact-based analysis and assessment of the proposal and its critical elements for implementation.

A recognized world leader in climate and air quality policy since 1985, the Center for Clean Air Policy (CCAP) is an independent, non-profit think tank with international recognition. Headquartered in Washington D.C., CCAP assists policy-makers around the world in developing, promoting and implementing innovative, market-based solutions to major climate, air quality and energy problems that balance both environmental and economic interests.

CCAP's report elaborates and explains the architecture and specifications embedded in the proposal for an auction-based financing system. The analysis shows how the Norway auction proposal can be implemented.

We wish to thank CCAP and the excellent analyst group for their efforts. The Government of Norway has provided funding for the report. The conclusions and recommendations are CCAP's own.

We hope this report will be a valuable contribution to the overall debate on climate change financing, and that others - both in and out of government - will find it useful.



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List of Acronyms

AAU	Assigned Amount Unit
AWG-LCA	Ad-hoc Working Group for Long-term Cooperative Action
CA	Copenhagen Agreement
CCAP	Center for Clean Air Policy
CDM	Clean Development Mechanism
CER	Certified Emissions Reduction
CITL	Community Independent Transaction Log
CMO	Carbon Market Operator
CO2	Carbon Dioxide
COP	Conference of Parties
DC	Developing Country
EC	European Commission
EPA	Environmental Protection Agency
ERU	Emission Reduction Unit
ETS	Emission Trading System
EU	European Union
EUA	EU Allowance
GAAU	Generic Assigned Amount Unit (for auctioning)
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIS	Green Investment Scheme
ICAP	International Climate Action Partnership
IETA	International Emissions Trading Association
ITL	International Transaction Log
JI	Joint Implementation
KP	Kyoto Protocol
LDCs	Least Developed Countries
MAF	Multilateral Auction Facility
NAMA	Nationally Appropriate Mitigation Action
NAPA	National Adaptation Programs of Action
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
REDD	Reduced Emissions from Deforestation and Degradation
RGGI	Regional Greenhouse Gas Initiative
UK	United Kingdom
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USAID	US Agency for International Development
W-M	Waxman-Markey Bill

Executive Summary

The government of Norway has proposed that the Copenhagen Agreement provide for the auctioning of greenhouse gas (GHG) emission allowances that could be used by countries accepting Kyoto-style emission targets for the period after 2012. The auctioning of such allowances (which were called Assigned Amount Units, or AAUs, in the Kyoto Protocol) could provide a new, additional, and reliable source of funding for adaptation, capacity building, reduced emissions from deforestation and degradation (REDD), and some mitigation activities in developing countries.

The revenues from auctioning AAUs could be used in part to help finance Nationally Appropriate Mitigation Activities (NAMAs) in developing countries (DCs). This would assist Annex 1 countries in meeting their commitments to provide financing under the Bali Action Plan. The use of AAU auction revenue for NAMA financing could therefore potentially be a key component of completing a climate agreement at Copenhagen.

Although the current market demand for AAUs is rather limited, the demand for AAUs in auctions in the post-2012 period would likely be much stronger for a variety of reasons. The limited current market is a result of the fact that AAUs are associated with particular countries having excess allocations. These countries are expected to implement Green Investment Schemes (GIS) with the proceeds of their AAU sales to ensure that environmental goals are met. Currently, therefore, AAUs are highly differentiated products with the implicit brand names of individual countries.

However, AAUs allocated for auctioning under a Copenhagen Agreement will not be the property of any particular country and will not require an associated GIS. Instead, they will belong to the entire international community that accepts Kyoto-style targets for the next commitment period. The AAUs allocated for auctioning could therefore be called generic AAUs, or GAAUs, to distinguish them from the AAUs given to individual countries. To help promote the marketability of GAAUs, registries should distinguish them from the AAUs allocated to countries.

The marketability of GAAUs would also be boosted if the Copenhagen Agreement includes shorter compliance periods for countries than the five-year interval of the Kyoto Protocol. For instance, the European Union (EU) has suggested the possibility of a one-year compliance period. A one- or two-year compliance period for countries would improve participation in GAAU auctions, promote the development of a market for AAUs, and boost efforts to integrate world carbon markets.

Demand for GAAUs would be especially robust if private sector firms could use these instruments for compliance in domestic and regional cap-and-trade programs. At present, private firms in Japan are allowed to use AAUs to meet voluntary emission reduction goals. In operating their emission trading systems (ETS), the EU, Australia, New Zealand, and other countries should consider allowing private firms to meet their compliance obligations with GAAUs in the period after 2012. Private firms

in these cap-and-trade programs can or will be able to use Certified Emission Reductions and Emission Reductions Units for compliance purposes, and GAAUs should be accorded similar status. Similar to the case for CERs and ERUs, GAAUs submitted by complying companies would be retired from the ETS, but not from the receiving country's own Copenhagen compliance account. Allowing private firms to use GAAUs for compliance would not automatically imply that the AAUs allocated to individual countries could also be used for compliance. The advisability of allowing private firms to comply using the AAUs allocated to individual countries would be a separate and different case.

GAAUs could be sold through a variety of ways, including sales of small amounts through exchanges, dealers, and brokers, along with large operations involving public underwritings and auctions. Auctions are most useful for large and repetitive sales. There is considerable international experience in conducting sales of various financial instruments through these types of mechanisms.

Estimates of the amounts of funding that may be required for the indicated climate change activities in DCs in the 2013-2020 period are very uncertain. To cope with the uncertain need for disbursements, a reserve of liquidity should be created by making some advance sales of GAAUs. The liquid resources could be invested in safe, short-term instruments in world money markets until disbursements for the ultimate purposes of the auction program are needed.

Another option for raising advance funds would be the collection of issuance fees on the AAUs that are distributed to countries under a Copenhagen Agreement, as suggested in a 2008 proposal by Norway. Issuance fees would be collected only when countries receive their initial allotment of AAUs, not on subsequent transactions of AAUs. Though not part of Norway's proposals, a fee could also conceivably be charged on the carryover of excess AAUs from the Kyoto period.

The amount of GAAUs to be auctioned over the post-2012 commitment period could be determined as part of the Copenhagen Agreement. To underscore the generic nature and joint international ownership of GAAUs, they should not be seen as deductions from the AAUs allocated directly to countries. However, the amounts of AAUs allocated to countries should be lowered to take account of the availability of GAAUs in future auctions. Thus, emission targets for countries taking Kyoto-style commitments, the allocations of AAUs to countries, and the amount of GAAUs to be created should probably be determined simultaneously at Copenhagen.

The 2020 emission goals announced by Kyoto countries often include ranges and conditionality, and the method for translating 2020 goals into emission targets for a possible 2013-2020 commitment period is uncertain. The announcements suggest, however, that an order of magnitude of about 75 billion AAUs could be created for that commitment period. GAAU prices could potentially approximate the average forecast price of €40 for allowances in the EU ETS over that period. If so, about €30 billion of revenue could be generated over the period for each percentage point of

AAUs that are allocated for auctioning. At current exchange rates, that would amount to about $44 billion or $5.5 billion per year.

The form in which the United States (US) will participate in an agreement at Copenhagen is still undetermined and this paper does not take a position on the issue. However, inclusion of the US in a program to raise funds for climate change activities in DCs is of great importance. Therefore, the paper discusses a possible role for US participation under the assumption that the US does not take a KP-style emission commitment (one involving the issuance of AAUs). The US could nevertheless contribute to this fund-raising effort through annual budgetary appropriations or the allocation of allowances from a US cap-and-trade program.

Under the Waxman-Markey bill (W-M), the US would contribute 7% of the allowances from its domestic cap-and-trade program to international adaptation, clean technology deployment, and REDD between 2012 and 2020. The US could potentially support the international resource generation effort involving AAU auctioning by channeling some of those allowances through the institution carrying out the AAU auctions.

Under W-M, US emission targets for 2013-2020 would be roughly two-thirds of the sum of those indicated for Kyoto countries (ignoring the effects of offsets, set-asides, and allowance banking). If the US provided an allowance *value* equal to its share of emissions, it would contribute about $3.7 billion per year for each percentage point of AAUs allocated to auctioning. Adding that to the Kyoto countries' contribution of $5.5 billion of revenue, the total annual average revenue could amount to $9.2 billion per year for each percentage point of AAUs allocated to auctioning.

Other non-Kyoto countries could also be encouraged to participate through budgetary appropriations or allocations of domestic allowances. Indeed, AAU auctioning could be combined with other proposals involving financial commitments from a broad range of countries.

The overall responsibility for GAAU auctioning could rest with the Conference of Parties (COP) of the UNFCCC. Negotiations among Parties would likely determine the amount of AAUs allocated for auctioning and the contributions from non-Kyoto countries. The COP would then set guidelines for how the resources would be mobilized and used, and the agencies that would be involved in implementing the program. An auctioning facility could be created as a new function in an existing institution or in an institution created to implement the Copenhagen Agreement. Another alternative would be to create a small, special purpose auction agency that would report to the COP. The COP would then be responsible for determining, perhaps by formula, the allocation of auction revenues among the categories of adaptation, capacity building, REDD, and mitigation.

1 Introduction

The funding available for adaptation, reduced emissions from deforestation (REDD), and capacity building for climate change activities in developing countries (DCs) has been inadequate to meet environmental and social needs. While carbon markets have provided some funding for climate mitigation activities in DCs, the amount of financing for that purpose too has been inadequate. Finally, substantial new finance from Annex-1 countries may be needed to help DCs undertake Nationally Appropriate Mitigation Activities (NAMAs) as part of the Copenhagen Agreement (CA).

Financing through the normal budgetary appropriations of Annex-1 countries has been both inadequate and unreliable. For example, pledges to meet targets for Official Development Assistance (ODA) have often gone unfulfilled. Moreover, in the current situation of a global economic recession, it may be difficult for Annex-1 countries to commit to providing sufficient levels of finance through normal budgetary processes.

The Government of Norway has addressed the challenge of financing for climate change activities in DCs by proposing auctions of Assigned Amount Units (AAUs). AAUs are the compliance instruments for countries under the Kyoto Protocol (KP), and could potentially be used again in the CA. Norway discussed its proposal to auction AAUs in submissions to the Ad-hoc Working Group for Long-term Cooperative Action (Norway, 2008a&b, 2009). To implement the Norwegian proposal, an auctioning facility could be created as a new function performed an existing institution or as a small separate entity (as discussed toward the end of this report). Auctioning AAUs would generate funding for a variety of climate change activities in DCs, potentially including capacity building, adaptation, REDD, and some mitigation activities.

This paper addresses a number of issues associated with the possible implementation of the Norway AAU auction proposal, including the marketability and monetization of AAUs, measures for ensuring the flow of funding, potential means for involving the United States, and an institutional architecture for implementing the scheme.

2 The Financing Needs and Potential Funding

2.1 Scope of Assistance

As noted above, Norway's proposals have mentioned capacity building, adaptation, REDD, and more expensive mitigation projects in DCs. The emphasis has thus been on activities that are not amenable to funding through carbon markets. Mitigation projects in DCs have been funded through the KP's Clean Development Mechanism (CDM), which issues offset credits in the form of Certified Emission Reductions

(CERs). In addition, Joint Implementation projects in transition economies with KP targets involve the conversion of AAUs into Emission Reduction Units (ERUs). CERs and ERUs can be used for compliance by KP countries and by private firms in the emission trading system of the European Union (EU ETS). In addition, voluntary offsets compose a small part of the world carbon market. However, the funding of mitigation in DCs through carbon markets has been more limited than had been hoped.

In the future, project finance for climate mitigation in DCs is likely to be supplemented by credits for sector programs. A DC's sector programs may consist of one or more NAMAs (such as deployment goals for particular technologies). According the Bali Action Plan, DCs will be expected to undertake some NAMAs in part with technology and financial help from Annex-1 countries. Some of the NAMA financing could potentially come from the purchase of offset credits by private firms in Annex-1 countries that are subject to a cap-and-trade program. However, under the Bali Action Plan, financial assistance would also come from official sources. In the current financial environment, however, the funding available for NAMAs from Annex-1 governments may fall short of what is needed. The gap might be filled in part through the allocation of allowances, or the revenues from auctions of allowances, in cap-and-trade programs in the EU, the United States (US), and possibly other countries.

Auctioning of AAUs is another source of funding that could potentially be used to fill the gap in the financing of NAMAs. It could therefore help complete a deal at Copenhagen. Auctions of AAUs would be a source of public financing that could help Annex-1 countries meet their financial contribution requirements under the Bali Action Plan. Even if some of the auctioned AAUs were sold to private investors, the proceeds would in principle belong to the Annex-1 countries accepting a KP-like commitment at Copenhagen. Therefore, use of those funds to finance NAMAs could be a key source of the Annex 1 commitment needed to complete an agreement at Copenhagen.

The amounts of funding needed for the above purposes are very uncertain. As an example, the section below discusses potential funding needs in one key area—adaptation activities in DCs.

2.2 Estimates of Adaptation Financing Needs

In 2007, the United Nations Framework Convention on Climate Change (UNFCCC) estimated that, by 2030, the annual adaptation needs of DCs would be in the range of $28-67 billion ($ refers to US dollars in this paper). These estimates were in part informed by earlier estimates of annual adaptation needs in DCs of around $10-40 billion (World Bank, 2006) and $50 billion (Oxfam, 2007), as shown in Table 1. A 2008 UNFCCC paper, designed in part to update such findings, did not endorse specific estimates, but cited another estimate of $86 billion of financing needs for 2015 in a report by the United Nations Development Program. By contrast, the least developed countries (LDCs) have identified only about $1.5 billion of projects in their

National Adaptation Programs of Action (NAPAs), half of which was accounted for by a single large water-development project in Ethiopia. The relatively small financing needs in NAPAs was attributed to the fact that they were only for "urgent and immediate" adaptation requirements in just 38 countries, not what is needed to address medium and longer-term adaptation in all DCs.

Table 1: Estimates of Adaptation Financing Needs in Developing Countries

Source	Year	Amount (per year)	Base Year	Method
World Bank	2006	$9-41 billion	2006	Estimate proportion of investments that are climate sensitive and funding needed to 'climate-proof' these investments.
Stern	2006	$4-37 billion	2006	Update to World Bank method.
Oxfam	2007	> $50 billion	2006	World Bank method plus global extrapolation of NAPA implementation and community-based adaptation programmes.
UNDP	2007	$80-109 billion	2015	World Bank method plus adapting Poverty Reduction Strategies to climate change and increased disaster risk reduction.
UNFCCC	2007	$28-67 billion	2030	Sectoral adaptation estimates using a combination of methods.

This brief survey suggests that adaptation financing needs could be very large over the longer-run, but the estimates span a very wide range. The OECD (2008) and others have discussed several ambiguities that contribute to different estimates of the funding needs:

- Unclear definition of adaptation. For instance, Levina and Tirpak (2006) identify four different definitions of adaptation that imply quite different funding requirements.

- Localization. Most international adaptation studies and funding allocations rely on a top-down approach while adaptation needs are by definition highly localized phenomena.

- Linkages between development and adaptation activities: Most adaptation activities have a development component to them and vice-versa. This makes it difficult to distinguish between the funding requirements of each.

2.3 Availability of Funding for Adaptation

As noted above, although estimates of the funding needs for adaptation in DCs are very uncertain, they often amount to several tens of billions of dollars. By contrast, the available and prospective sources of funds are far more limited. Three of the existing and potential sources are:

- The Adaptation Fund: This fund has a claim on 2% of the CERs issued by the CDM. Through September 8, 2009, 327 million CERs had been issued, implying about 6.5 million CERs provided to the Adaptation Fund. Estimates of the total amount of CERs likely to be issued through 2012 have been revised down and are now only about 1.25 billion (UNEP). This would imply about 25 million CERs for the Adaptation Fund through 2012. Valued at the current price of about €14, this would mean only about €350 million of total adaptation funding from CERs through that year.

- Future EU ETS auctions: While most EU allowances (EUAs) are being distributed for free through 2012, about half the allowances will be auctioned beginning in 2013. The European Commission (EC) has proposed that 50% of the auction revenues be used to support climate change efforts. If about 1 billion EUAs are auctioned annually from 2013 to 2020, the revenues could amount to €40 billion per year (using Point Carbon's EUA price estimate for 2016). Although half of that could be devoted to climate change activities, many of those activities may be located in Europe itself. Mitigation activities may take a large share whatever portion is allocated to DCs. The amounts remaining for adaptation in DCs might be only a small fraction of the total.

- US: Under the provisions of the Waxman-Markey bill, 1% of US allowances (about 50 million allowances per year over 2012-2020) would be used for international adaptation. At an average price of about $15 over that period (EPA estimate, 2005$), that would amount to about $750 million per year.

The existing and potential sources of finance for adaptation activities in DCs are thus well below most estimates of the annual funding needs.

2.4 Uncertainties in Disbursement Timing

While the overall adaptation finance needs are very uncertain, the timing of the required disbursements of funds for adaptation projects is even more difficult to predict. Projects need to be identified and prioritized and then preliminary studies need to be completely before realistic financing budgets can be developed. This type of bottom-up work has barely begun; it will itself require a considerable commitment of expertise and financing. For these and other reasons, the implementation of adaptation projects is unlikely to proceed at a smooth, predictable pace. In some years, large projects may be ready for a substantial commitment of funds. In other years, the funding needs will be much smaller.

This discussion of adaptation needs highlights uncertainties regarding only one of the possible areas for the use of AAU auction revenues. However, it is illustrative of the notion that, while potential funding needs are apparently enormous, the uncertainties about the magnitude and timing of those needs are also very large. Because of those uncertainties, a new global financial mechanism should include the following features:

a) Flexibility: The mechanism should have the ability to generate revenue as needed for varying annual disbursement requirements while also ensuring that cumulative resource mobilization goals are met.

b) Adequacy: Although the amounts needed are uncertain, they are apparently far beyond currently available resources.

c) Reliability: In order to justify the substantial investment of expertise and funds needed to develop adaptation and other climate change projects, DCs need to be convinced that a reliable source of funds is available. The financing mechanism therefore has to distinguish itself from the unpredictability evident in flows of ODA in the past. In addition, to the extent that the mechanism relies on funding through carbon markets, the flow of funding should not dry up at times when market conditions become unfavorable.

The following sections describe design options that could help to achieve these objectives.

3 Revenue Generation from AAUs

This section of the report assesses the volume of revenues that could potentially be mobilized through monetization of Assigned Amount Units under the CA. An AAU is a tradable right to emit one metric ton of CO2-equivalent greenhouse gas. Under the KP, countries must hold an AAU, CER, ERU, or CO2-removal unit for each ton of emissions during the 2008-to-2012 period. The amount of AAUs received by a country was equal to its agreed GHG emission cap, which was expressed as a fraction of its emissions level in a base year (usually 1990).

3.1 Total Available AAUs

Table 2 shows the countries that accepted emission reduction commitments under the KP, with EU countries combined. The US is excluded because it did not ratify the Protocol. Column two shows the level of AAUs for each country/region for the five-year KP commitment period. The total is about 54 billion AAUs.

The last two columns of Table 2 show estimates of the potential total AAUs that may be issued to KP countries for an assumed CA commitment period of 2013 to 2020, based on the announced emission goals of the various countries. The estimates are limited to those countries/regions that have accepted KP emission caps. For the EU, we have taken the goal for 2020 to be a 20% reduction below the 1990 level. For Japan, an 8% reduction below the 1990 level was assumed. Russia has announced a range of 10% to 15% reductions, relative to 1990, by 2020; a 15% level is assumed for the table.

The precise method for translating announced 2020 emissions goals into emission targets for the next commitment period is still undetermined, and a variety of methods are under discussion. This paper takes no position on those alternatives. For the

purpose of discussion, however, two alternatives are used in Table 2 to give an idea of the possible range of results. In the middle column of the table, the AAUs are assumed to equal a linear projection from a base year of 2010 to the announced 2020 goal. The base year level is the annual average Kyoto target. Under this assumption, the table shows total AAUs for the 2013-2020 commitment period of 80 billion and the annual average of 10 billion, about 7% lower than the annualized Kyoto target of 10.75 billion. In the last column, the AAUs for the 2013-2020 commitment period are assumed to equal eight times the 2020 goal, which gives a smaller estimate of 76 billion for the period and an annual average of 9.5 billion.

If countries end up accepting stricter targets, the forecast of AAUs for the next commitment period would be reduced from those shown in the table. For instance, if Japan's target for 2020 turns out to be 25% below the 1990 level, as indicated by the new administration, and the EU's target becomes 30% below 1990, the total AAU forecast for the period would be about 5 billion lower than shown in the table.

Table 2: KP and Forecast AAUs

Countries	**KP Period (2008-2012)**	**Future Commitment Period (assumed to be 2013-2020)**	
		Linear Path	8 times the 2020 Level
Australia	2.96	4.40	4.20
Belarus	0.34	0.55	0.55
Canada	2.72	5.11	4.60
Croatia	0.14	0.25	0.26
EU	19.62	28.73	27.30
Iceland	0.02	0.04	0.03
Japan	5.94	9.43	9.36
New Zealand	0.31	0.42	0.37
Norway	0.25	0.23	0.20
Russia	16.62	24.02	22.60
Switzerland	0.26	0.34	0.32
Ukraine	4.56	6.42	5.90
Total	**53.74**	**79.93**	**75.69**
Annual Average	**10.75**	**9.99**	**9.46**

Source: UNFCCC submissions.

Notes:

The above numbers are not a complete measure of the comparable stringency of the two commitment periods, as the use of offsets may differ across the periods and the Copenhagen targets are not finalized.

Also, the Kyoto AAUs for Belarus and Croatia are estimated owing to uncertainties about the calculation of base year emission levels.

Suppose, for the sake of discussion, that about 75 billion AAUs are created for an eight-year commitment period through 2020. If the price of AAUs averaged €40 over this period (the Point Carbon estimate for the EUA price in 2016), the total value of AAUs would be about €3,000 billion. At current exchange rates, that would amount to about $4,380 billion or almost $550 billion per year. Each percentage point of that AAU value allocated for auctioning would thus generate about $5.5 billion of revenue per year over the period.

3.2 Commitment and Compliance Periods under Copenhagen

The length of the commitment period under the Copenhagen Agreement is as yet unclear. In the KP, the commitment and compliance periods were both five years in length. However, the CA could include several compliance periods within one longer commitment period. With shorter compliance periods, enforcement mechanisms would be better tested and countries may make more timely adjustments, if needed, in mitigation policies. An eight-year compliance period would make enforcement and country policy adjustments even more uncertain than under the KP.

The idea of a ten year commitment period for the CA, which would be broken into two five-year compliance periods, has already been discussed. The EU (2009a) has even suggested one-year compliance periods. Other alternatives could include breaking a 2013-2020 commitment period into two four-year compliance periods or four two-year compliance periods. A one- or two-year compliance period under the CA would have the side benefit of helping to foster the development of a market for AAUs and the linking of that market with other carbon markets around the world.

3.3 Allocations and Accounting for AAUs

It is also unclear whether the CA will follow KP approach of giving countries their entire allotment of AAUs at the start of the commitment period. Considerable work has been done to establish procedures to account for transactions of Kyoto units (compliance instruments under the KP). Countries have established national registries to record ownership and transfers of AAUs, CERs, and ERUs. To ensure accurate, transparent and efficient exchange of data, the UNFCCC has established technical standards for these registries.

The UNFCCC secretariat has also created an International Transaction Log (ITL) to record the ownership and transfers of these units. The ITL tests whether proposed transactions are consistent with rules of the KP. After verification, the individual registries are then allowed to complete the transactions.

The EU ETS has also established a Community Independent Transaction Log (CITL) to record transactions of EUAs. At present, each EUA is associated with an AAU. EUA transactions must therefore be approved by both the CITL and the ITL. The EU is planning to delink EUAs from AAUs after 2012, which would reduce dependence of EU ETS transactions on ITL rules and perhaps facilitate linkages of the EU ETS to cap-and-trade programs in non-KP countries.

3.4 The Market for AAUs

3.4.1 The Current Market

The current market for AAUs consists largely of bilateral trades between KP member countries. Japan also allows private firms to purchase AAUs and use them to meet the firms' emission reduction targets. The AAU market is a tiny part of the overall carbon market. In 2008, AAU trades represented only 0.5% of the volume and 0.2% of the value of world carbon markets (see Table 3).

Table 3: Carbon Markets in 2008

Carbon Market	Volume *(MtCO2e)*	Value ($Mn)
EU ETS	3,093	91,910
New South Wales	31	183
Chicago Climate Exchange	69	309
RGGI	65	246
AAUs	18	211

Source: World Bank

However, AAU transaction volumes have picked up in 2009 owing to factors such as the development of Green Investment Schemes in transition economies (see below) and later-than-expected deliveries of CERs. Table 4 shows reported AAU transactions through June 2009.

Table 4: Reported AAU Trades through June 2009

Seller	Buyer	Volume (Mn)	Euros/AAU
Hungary	Belgium	2.00	14 - 15
Hungary	Spain	6.60	14 - 15
Slovakia	Interblue Group	10.00	6.05
Latvia	Netherlands	3.00	10
Ukraine	Japan	30.00	9.8
Czech Republic	Japan	40.00	9.8
Latvia	Austria	2.00	2
Slovakia	Japan*	0.20	na
New Zealand	Japan*	0.05	8

* Private firms.
Source: Trading Carbon, World Bank

To develop a more active AAU market, several key issues need to be resolved:

- Large AAU Surpluses

  In the KP, a number of countries have found themselves with large surpluses of AAUs due to lower-than-expected economic growth. Countries with large AAU surpluses have generally agreed to implement Green Investment Schemes (GIS) to ensure that the proceeds of those AAU sales are used to generate environmental benefits. The activities could range between investment in mitigation-based activities (referred to as hard greening) and capacity and institution building (referred to as soft greening). The estimated supply of AAUs with GIS for the 2008 – 2012 period is shown in Table 5. The supply from Russia is too uncertain to estimate, but could potentially amount to several billion AAUs.

Table 5

	GIS Supply (MtCO2e)	
	Likely	Max
Bulgaria	0	20
Czech Republic	100	100
Hungary	100	100
Latvia	40	40
Poland	100	500
Romania	100	100
Russia	??	??
Slovakia	50	50
Ukraine	500	1,000
Total	**990**	**1,910**

Source: World Bank

- Potential AAU Buyers

  As noted above, buyers of AAUs for compliance purposes are currently limited to KP countries and some private firms in Japan. This is a very small potential participant base for auctions. By contrast, the EU ETS covers approximately 10,000 entities and the Regional Greenhouse Gas Initiative of the US covers about 225 installations.

- Uncertainty regarding banking

  KP rules allow an unlimited amount of AAUs to be banked (carried forward) from the current commitment period to the next period. The carryover amounts could be very large. For instance, the International Emissions Trading Association (IETA, 2009) estimated that Russia alone could carry forward 6 billion AAUs. IETA highlighted potential disadvantages of such large AAU carryovers: considerable uncertainty for carbon markets (adding to already large uncertainties about the future of the CDM), substantial weakening of future carbon prices, and

a threat to environmental goals. A large carryover from the KP period would also weaken demand for AAUs in future auctions.

3.4.2 Future Emissions Targets and Offset Credits

Strict emission targets for Annex-1 countries are the most important requirement to improve the marketability of AAUs in the CA period. The availability and cost of offset credits, along with any restrictions on their use, will also play an important role. In the CA period, credits may be generated by Nationally Appropriate Mitigation Actions and sectoral programs, as well as the more traditional project-based offsets. AAUs will thus constitute one segment of a larger, multi-faceted international carbon market. AAUs slated for auctioning could claim a price premium relative to instruments that depend on the implementation of emission reduction projects, as discussed below.

3.4.3 Generic AAUs

The limited current market for AAUs partly reflects the association of AAUs with particular countries having excess supplies and the need for those countries to implement GIS programs to gain international acceptance of their AAUs. At present, therefore, AAUs are not a homogenous commodity; they are differentiated products trading at varying prices that depend on the country of origin and the associated GIS.

In the CA commitment period, AAUs allocated for auctioning should be seen as high-quality instruments that are owned by the international community at large rather than a particular country. AAUs allocated for auctioning will not carry the brand name of any country and will not require a GIS to ensure that environmental goals are met. AAUs allocated for auctioning could therefore be called generic AAUs, or GAAUs. GAAUs should have a permanent identification marker that would show up in registries. By this device, GAAUs would remain distinct from country-specific AAUs and a secondary market for trading in GAAUs would then be more likely to develop. The existence of an active secondary market would improve participation in auctions.

3.4.4 Differentiating GAAUs by Use Category

GAAU auctions could also potentially be differentiated depending on the intended use of the revenues. For instance, some auctions could be dedicated to adaptation activities, while others could be for capacity building or REDD. Investors with a preference for one of the uses of the funds, but not others, might then be more inclined to participate. Some market research would be needed, closer to the time of the auctions, to determine if this approach would improve participation and the total amount of revenues that could be generated. One possible disadvantage of this approach could be an imbalance in resource mobilization, relative to the distribution of actual disbursement needs across the potential uses. Again, the balance among resources and disbursement needs should be assessed closer to the time of the auctions.

If the device of earmarking revenues from specific auctions is employed, individual GAAUs should nevertheless not be tagged permanently with a use category. After auctioning, GAAUs should be homogeneous instruments, thereby promoting the development of a liquid secondary market and avoiding market fragmentation.

3.4.5 Private Sector Participation in AAU Auctions

As noted above, private firms in Japan have already bought a small amount of AAUs. Participation in future GAAU auctions could be greatly increased if private firms in other domestic and regional cap-and-trade systems could also use GAAUs for compliance purposes. In particular, the administrators of cap-and-trade programs in the EU, Australia, New Zealand, and other potential countries could consider allowing private firms to use GAAUs for compliance purposes.

The world's largest carbon market is currently the EU ETS. Roughly 2 billion allowances (EUAs) are issued per year in that system. Currently, private firms in that market are not allowed to use AAUs for compliance, other than the AAUs of EU members that are implicitly associated with EUAs. If private firms in the EU ETS could use GAAUs from future auctions for compliance purposes, the auction demand would be very robust.

Most EUAs are being distributed to companies for free over the 2008 to 2012 period. However, in the 2013-2020 period, around half of the EUAs are expected to be auctioned. Thus, private firms will be familiar with bidding for emission allowances in auctions and that experience would help promote their participation in GAAU auctions as well.

Would GAAU auctions reduce the demand for CERs and therefore the flow of project investments in DCs? At present, European firms and governments dominate the market for CERs, accounting for 80% and 10%, respectively, of the primary (first-sale) market. However, the demand for project credits in the CA period will likely depend on many factors. The implementation of a cap-and-trade program in the United States, the stringency of future Annex 1 targets, and the availability of credits from NAMAs and sectoral programs will likely have a larger effect on the net demand for future project credits than the auctioning of GAAUs. Moreover, the funds raised by GAAU auctions will themselves be used for climate change activities in DCs.

3.5 AAU Issuance and Carryover Fees

Norway has raised the idea of an issuance tax, or issuance fee, as one option for raising funds from new AAUs (Norway, 2008b). The concept involves a small payment by KP countries for each of the AAUs they receive under the CA. For instance, each country could be required to pay a fee of €0.50 for every AAU received to cover their 2013-2020 emissions. The fee would be well below the market price of carbon and also below the marginal cost of reducing carbon emissions. Therefore, countries would have a strong incentive to pay the issuance fee and accept their allotments of AAUs.

However, the timing of the allocations of AAUs to countries could be affected by the imposition of issuance fees. The length of compliance periods under the CA could play a key role. Suppose, for instance, that the compliance period and commitment period are both eight years in length (2013 to 2020). If countries only need their AAUs at the end of the period, they may fail to appropriate the funds to pay the issuance fees until 2020. Indeed, by waiting, countries would have a better idea of their emission levels over the period and of the conditions in carbon markets. Long delays in paying issuance fees would defeat the purpose of raising funds for the 2013-2020 period and also undermine the idea of developing a market for AAUs.

One way to discourage delays would be to increase the issuance fee each year by an amount that would provide a sufficient incentive for countries to accept their AAUs at the earliest possible date. For instance, the fee could be €0.50 in 2013 and then rise by €0.50 each year till hitting €4 in 2020. (A schedule of gradually rising fees would likely be preferable to imposing explicit penalties on countries for late payments.)

Of course, if compliance periods were as short as one or two years, countries would have a natural incentive to purchase AAUs more frequently. Even then, however, a discount for early payments of issuance fees could help accelerate receipt of funds and perhaps promote AAU market development.

Note that an issuance fee is not the same as a transaction tax. An issuance fee is payable only on the initial distribution of AAUs. It is not paid again when there is a change in the ownership of an AAU. As mentioned in Norway (2008b), transaction taxes should be avoided. They tend to restrict trade, create inefficiencies, and impair the development of markets.

An issuance fee could potentially raise a substantial amount of funds. If over 70 billion AAUs were allocated to individual countries for the 2013-to-2020 commitment period, a €0.50 fee would imply at least €35 billion. If fees were increased after 2013, the total fee revenue could be larger still.

Fees are also one possible way to address issues related to the carryover of excess AAUs from the 2008-to-2012 period. Carryover fees were not part of Norway's proposal. The idea would be to assess a fee on each KP AAU that is carried over into the CA period. Like an issuance fee, a carryover fee would be applied only once. A country could carry an unlimited number of AAUs from 2012 into the next period as long as it paid the carryover fees. Later sales of those banked AAUs would not be subject to any fees.

Issuance and carryover fees could be combined with revenues from GAAU auctions. These fees would provide a means for countries with excess AAUs in the KP period to contribute to the global adaptation effort. Such countries do not sponsor CDM projects and contribute in the form of the 2% levy on CER issues.

3.6 Monetizing Generic AAUs

3.6.1 Allocations of AAUs for Auctioning

The amounts of AAUs that could be involved in the CA commitment period depend on the length of the period, the countries that take KP-like commitments, and the stringency of those commitments. The above analysis assumed that all KP countries, but no other countries, take new KP-like commitments at Copenhagen. That led to estimates on the order of magnitude of 75 billion AAUs in total for a 2013-2020 commitment period.

As part of the CA, some AAUs could be allocated directly for auctioning. These GAAUs would be owned implicitly by all Parties taking new KP-like commitments. As such, they would not be interpreted as deductions from individual country allocations. However, the Parties should be expected to lower the AAUs they would receive directly to take account of the fact that additional AAUs would become available through auctions. The negotiations over target setting and AAU allocations for countries and for auctioning should be completed simultaneously.

As noted above, for each percentage point of AAUs allocated for auctioning out of an estimated total of 75 billion of AAUs for the 2013-2020 period, about €30 billion of revenue would be generated at average GAAU selling price of €40. That would amount to €3.75 billion per year (or $5.5 billion at current exchange rates).

3.6.2 Non-Auction Methods of Selling GAAUs

A number of methods could be considered for selling GAAUs in addition to auctions. There could be occasional large underwritings, frequent smaller transactions using brokers, or bilateral sales (private placements). Sales could be undertaken for immediate or future delivery. At present, it is difficult to determine the optimal combination of sales methods, as the existing AAU market has been so limited. However, the improved marketability of GAAUs, relative to the current AAU market, could open up such possibilities.

Many of these sales methods have already been used in carbon markets. As noted above, most AAU sales to date have been undertaken on a bilateral basis. In addition, the government of Germany has undertaken some sales of EUAs through brokers.

Similarly, the Adaptation Fund has sold CERS through intermediaries, rather than through auctions. The World Bank, as trustee for the Adaptation Fund, has contracted with major market intermediaries to complete some of these sales in the over-the-counter market. In May, 2009, Barclays Capital acted as a dealer for the sale of 600,000 CERs. In June, Bank of America Merrill Lynch acted as dealer for the sale of 500,000 CERs. In these arrangements, the World Bank sells CERs to the dealers who agree to resell them rather than retain them for their own accounts. The dealers earn a return by reselling at a higher price. It takes about a week to complete

each block of sales through a particular dealer. World Bank staff specify a minimum price for the sales each day; they report having received prices above the closing prices of CERs. The ultimate buyers of the CERs included a wide range of entities across economic sectors and geographical regions, including private firms in the EU ETS and corporations purchasing voluntary offsets. Aside from these large sales through major dealers, the World Bank is also conducting sales of smaller amounts of CERs directly through carbon exchanges.

A dealer typically takes more responsibility for a sale than a broker. In particular, unlike a broker, a dealer will put up some of its capital to make purchases for its own account. An underwriter goes a step further, guaranteeing the sale of a certain quantity of securities at a given price. An underwriter of a public offering of securities typically enlists a number of financial institutions to act as the management and selling group. In underwritings of bonds and stocks, the ultimate buyers may include a wide range of institutional and individual investors. By involving numerous financial institutions and providing guarantees of price and quantity, an underwriter can help ensure that an issuer's revenue goal is met. However, the fees can be substantial, depending on the amount of risk involved in the offering and the contractual escape clauses provided for the underwriter.

3.6.3 Auctions Compared with Other Sales Methods

Because of the potential for bidding among buyers, auctions should increase revenue generation relative to sales through brokers or through bilateral transactions. Auctions also offer considerable transparency and accountability checks that are especially important when multiple governments are involved.

Although auctions have considerable upfront setup costs, they likely involve lower per-sale transaction costs than public underwritings, because of the risk premiums that must be paid to underwriters. Public underwritings are most useful when a large number of investors need to be enticed to buy a security. The likely investors in AAUs, however, will be well-informed governments and corporations that generally will have considerable prior experience with auctions.

Auctions have the greatest advantage over other techniques when the sales occur on a repetitive basis, the schedule can be set in advance, multiple buyers are involved, and most of the buyers return for repeat purchases.

3.6.4 The Timing and Amounts of Auctions

If auctions are the chosen method to sell GAAUs, the appropriate timing for the auctions should be determined in light of the investors that will participate and the timing of their need for GAAUs. If governments alone can use GAAUs for compliance purposes, their needs will depend on the length of compliance periods under the CA. If firms subject to the EU ETS (or other cap-and-trade systems) are also allowed to use GAAUs for compliance, the auctions should be held at least once

per year. To facilitate planning by potential bidders, the schedule of auctions should be set well in advance and should not be altered except in unusual circumstances.

By contrast, the precise amounts of GAAUs to be offered in each auction can be more flexible. Investors will need a general idea of the size of future auctions, but the exact amount of GAAUs to be offered in a particular auction can be announced a few weeks in advance. That is often the practice in auctions of government debt. Flexibility about the amounts to be offered will allow the auctioneer to adjust to emerging market conditions. Such flexibility may also be needed to cope with unexpected developments regarding the imminent need for funds. Adjustments in the size of auctions are discussed further in the section of the report that addresses the flow of funding.

3.6.5 Comments from Carbon Market Participants

CCAP undertook an informal and confidential survey of several carbon market participants to assess views on the potential future marketability of AAUs. The participants strongly supported Norway's idea of auctioning AAUs but cautioned that the marketability of AAUs would depend on many of the factors mentioned above. In particular, they stressed the importance of future emission targets, the carryover of unused AAUs, and the state of the market for offset credits. Market participants thought that financial institutions and intermediaries would be willing to participate in auctions. Participants generally favored the use of compliance periods for countries that are shorter than five years but noted the challenges that would need to be overcome regarding the timeliness of data and MRV procedures.

3.7 Additionality of Funding

Purchasing AAUs, or paying issuance fees on them, will involve budgetary decisions for Annex 1 countries that will in principle be distinct from the appropriations for ODA. The payment of AAU issuance fees or the purchase of AAUs in auctions may be seen in a more favorable light, as they would not only help DCs but also serve an Annex-1 country's own need for compliance instruments to avoid defaulting on international treaty obligations. The appropriation of funds for this purpose might therefore prove more reliable than appropriations of foreign aid. In addition, the amounts spent on issuance fees and the purchase of GAAUs would not be part of a country's official contributions to ODA. The proceeds of monetizing GAAUs therefore may prove to be additional to other sources of finance for DCs.

4 Ensuring a Reliable Flow of Funding

4.1 Reliability vs. Smoothness of Financing

Norway proposed the auctioning of AAUs in part for the purpose of "ensuring adequate, predictable, and sustainable financial resources" for climate change activities in DCs (Norway, 2009). The financial flows that have depended on the budgetary appropriation processes in Annex 1 countries have not generally been sufficient to support adaptation, capacity building, REDD, and non-marketable mitigation activities in DCs. DCs need to be confident that adequate finance is available before devoting a substantial amount of their own scare expertise to preparing projects.

It is less clear, however, that financing is needed in a smooth, predetermined schedule. As noted above, estimates of the magnitude of funding requirements vary widely, and the schedule of future disbursement needs is even more uncertain. Unpredictably large amounts of funding may be needed in some years and much less in others. For this reason, GAAU auctions should not be designed to deliver an equal level of financing every year, nor even necessarily a path of smoothly rising amounts of funding.

Nevertheless, auctions should be conducted to establish a base level of liquidity, as a precautionary measure, to enable a response to unexpectedly large funding needs in some years. Issuance fees could one means of creating a precautionary reserve of liquidity. Other methods of generating liquidity may also be needed.

Even if the AAUs are allocated for auctioning at the beginning of the next commitment period, the adequacy and reliability of financing would not necessarily be ensured. The demand for GAAUs in the early years of the program might be rather limited and the selling prices could be difficult to predict. In ideal circumstances, with many private buyers along with governments, GAAUs might become actively traded in secondary markets and their prices might track fairly closely the larger market for EUAs.

For instance, prices for CERs follow those for EUAs, but at a lower level. The discount on CER prices likely reflects the more limited ability to bank these instruments into the post-Kyoto period and perhaps questions about their environmental quality. (In addition, advance sales of CERs involve even larger discounts, relative to futures contracts on EUAs, because of delivery uncertainties.) However, GAAUs should not be subject to any material discount, relative to EUAs, as long as GAAUs are accepted for compliance by all firms and countries participating in the EU ETS.

Even in the ideal circumstances of integration with the EU ETS carbon market, the amount of funds that could be raised through sale of a given quantity of GAAUs may be difficult to predict, given the fluctuations in EUA prices, as discussed below.

4.2 Price Volatility in the EU ETS

Carbon prices were especially volatile in Phase I of the EU ETS, from 2005 to 2007. However, these fluctuations largely reflected fundamental uncertainties about the level of emissions of regulated firms, which had never before been compiled. Nevertheless, the price fluctuations in that period partly reflected changing views about persistent factors in the outlook for emissions and the supply of compliance instruments. As an indication of the persistent forces, the price of the EUA futures contract that settles in December 2009 has also been quite volatile since it began trading in mid-2005, as shown in Figure 1. In principle, the prices observed on this contract should only reflect influences affecting the expected spot price of EUAs in December 2009. Table 6 provides summary statistics on the price of this contract, while Table 7 indicates the main forces behind price movements at various points in its history.

Figure 1

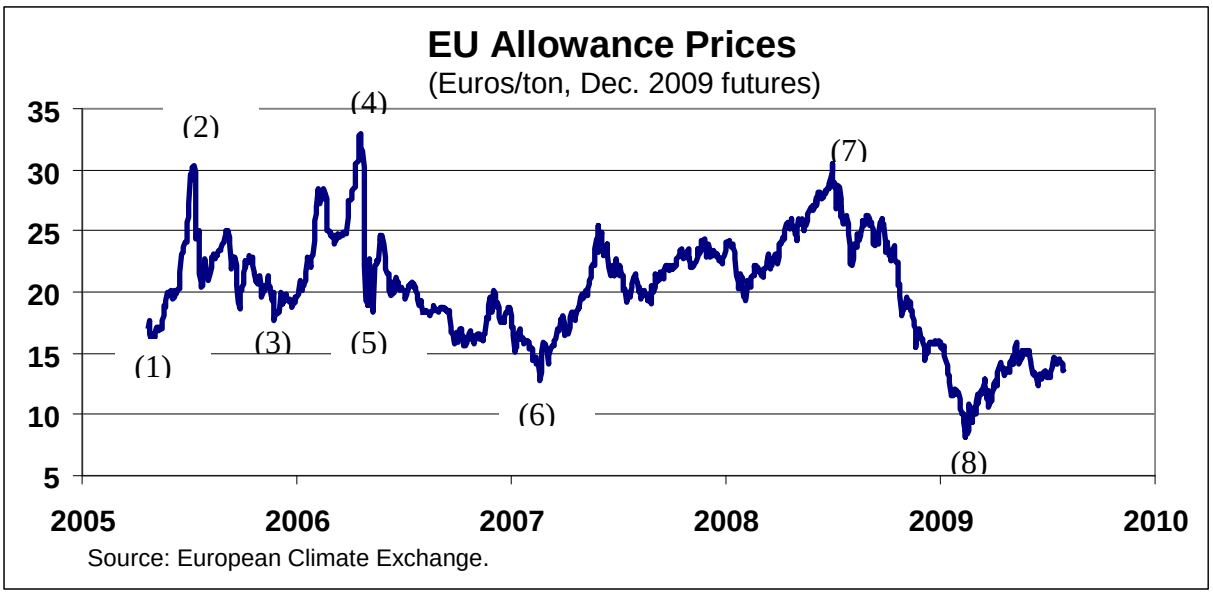


Table 6

Statistics	(Euro/TCO2)
Min	8.20
Mean	20.51
Max	32.90
Standard Deviation	4.40
Coefficient of Variation	21%

Table 7: Key Reasons for the Price Swings Shown in Figure 1

No.	Period	Reason
1	April 2005	Spot carbon prices were at a relative low at this time as five EU states had just reported fewer emissions in 2005 than their allowance allocations.
2	June 2005	High fuel prices, strong demand from western utilities, and lack of investment in abatement as yet.
3	December 2005	After a legal dispute with the EC, the UK's allowance allocations were revised up by 3 per cent.
4	March 2006	Uncertainties about anticipated emission reports pushed up prices.
5	April 2006	Emissions data proved to be much lower than expected.
6	February 2007	Lower gas prices and a mild winter. Germany was considering legal action against the EC to get additional emission allowances.
7	July 2008	A spike in energy prices and the EC's strictness about Phase II national allocation plans.
8	February 2009	EU and global economic downturn reduced demand for energy. In addition, firms sold excess EUAs to raise cash.

In sum, the key factors that have contributed to EU ETS price fluctuations and would likely affect future prices of GAAUs are:

(a) Economic cycles
(b) Political uncertainty
(c) Variances in weather conditions
(d) Energy price fluctuations
(e) Contagion from other carbon and commodity markets

4.3 Advance Sales of GAAUs

As discussed earlier, it is advisable to provide a predictable schedule of GAAU auctions so that potential bidders can make financial plans. However, the amount of GAAUs that will be offered in an auction need not be fixed far in advance. The amount could instead be decided upon and announced just a month or so before each auction date. Revenue goals and market conditions should both be considered when deciding on the amount to be offered in any auction.

A few billion AAUs may be initially be allocated for auctioning. These will need to be converted into liquid assets prior to disbursement for the intended purposes. However, the schedule of GAAU sales and the disbursement of funds need not be exactly synchronized. GAAUs can be sold well in advance and the proceeds held as liquid assets until disbursements are needed. Alternatively, disbursements could be made with borrowed money to be repaid later when the GAAUs are sold.

It would be possible to arrange for a smooth and predictable flow of funding through GAAU auctions. The amount sold in an auction could be determined after the bids were received and adjusted to achieve a pre-specified revenue goal. Under this approach, additional GAAUs would be sold if prices were unexpectedly low and fewer would be sold if prices were unexpectedly high. However, this procedure would fall well short of maximizing the revenue generated through auctions. More revenue would be generated if additional GAAUs were sold when prices are high, not when they are low. Considering also that disbursement needs may not be smooth and predictable, it is more advisable to create a liquidity buffer in advance than to vary GAAU issuance to hit predetermined revenue goals. To create a reserve of liquidity, advance sales of GAAUs could be arranged, as discussed below.

In many cap-and-trade programs, allowances have been sold or otherwise distributed well in advance of the time they are needed. One of the purposes of the advance distributions has been to promote the development of a market. Allowances to be used for compliance in the current year are often distributed early in the year. Moreover, allowances are frequently sold in advance of the year in which they can be used for compliance. The sale of future vintages is undertaken to raise money and to allow firms unable to access futures markets to make downpayments on their future compliance obligations.

Specific vintages should not be assigned to GAAUs, as that would fragment the market, causing GAAUs usable in different years to trade at different prices. To improve marketability, GAAUs should also not be subject to any discounts on banking or carryover fees. Any GAAU could then be used for compliance in any year. These features would preserve the generic character of GAAUs.

GAAUs could still be sold well in advance of the expected disbursement needs. Advance sales (though auctions or otherwise) would create a liquidity buffer and also demonstrate that resources are readily available for capacity building, adaptation, REDD, and non-marketable mitigation activities in DCs. This could help motivate DCs to develop project proposals. The ability to make advance sales would also promote enhanced revenue generation as more GAAUs could be sold when market conditions were especially favorable.

There would be no need for the auctioning body to hold GAAUs for its own purposes. The commitment period reserve that limits sales of AAUs by KP countries would not be applicable. (In the KP, countries are not allowed to sell AAUs if their holdings would drop below five times their most recent annual emissions inventory or 90% of their Assigned Amounts, whichever is lower.)

Market conditions would limit the amount of advance sales that could be undertaken. For instance, there should not be an attempt to sell a large fraction of the GAAUs at the beginning of the program. Governments and private speculators may not have the funds needed to purchase a billion or more GAAUs in 2012 or 2013. Even if sufficient bids could be found to buy a large fraction of the GAAUs at the inception of the program, the prices would likely be lower than that could be obtained with a more

measured pace of sales. Introducing an outsized supply of GAAUs into the market at the beginning of the program could have the effect of depressing prices for some time in other carbon markets as well, impairing incentives for mitigation investments.

If some advance sales of GAAUs are undertaken, or if substantial liquid resources are generated through issuance and carryover fees at the beginning of the program, the bulk of these resources could be invested in a diversified portfolio of safe, liquid assets in world capital markets. However, if the liquid resources far exceed estimates of the maximum near-term disbursement needs, some of those liquid balances could be lent on a longer-term basis for purposes consistent with the design of the program. For instance, funds could be invested in adaptation bonds issued by the World Bank or other international development organizations. When these investments are repaid, the funds could be reused for the grants or other direct funding for which AAU auctions were designed.

4.4 Debt Issues backed by Future GAAU Sales

Issuance and carryover fees, as well as advance sales of GAAUs, may provide ample liquidity. However, if no fee income is received, and if auction participation is inadequate in the early years of the program, other methods of raising liquid resources may need to be considered. One alternative is the issuance of debt. It is likely that the future of AAU auctions would be uncertain after the Copenhagen commitment period. For that reason, any debt issue would likely need to have a maturity date around the end of that commitment period. This would likely imply a tenure of at most ten years, which means a short- to intermediate-term issue compared with the longer-term bonds often issued by governments and corporations.

To arrange for marketing to a wide range of potential investors, a bond issue would need to be underwritten and sold by a group of investment banking firms. Typically, a lead manager of the issue arranges for the other underwriters and the selling group for the issue. Judging by the costs evident in the Eurobond market, about 1% of the proceeds of the issue might have to be paid to the underwriting group (Kollo, 2005).

Various devices could be used to improve the marketability of a bond issue and lower the interest rate it would have to pay. For instance, the bonds could be collateralized by a portion of the GAAUs. In addition, the first proceeds of future GAAU sales (in auctions or otherwise) could be deposited in escrow accounts to be used for debt service payments on the bonds. The extreme version of a credit-enhancement device would be the use of joint-and-several guarantees of KP-country governments. This would likely be unnecessary, however, and probably politically unfeasible.

4.5 The Use of Financial Derivatives

Financial derivatives are often used as a means of coping with volatility in market prices. These instruments are derivatives in that they are derived from the markets for immediate delivery of the underlying asset (the "spot" markets). They include futures, options, and other contracts for forward delivery.

These instruments could be used in various ways. One alternative would be to buy put options to protect against shortfalls in revenues from future auctions owing to general declines in carbon prices. A put is an option to sell an instrument at a given "strike" price. While it is unlikely that an options market for GAAUs will develop in next couple of years, an options market for EUAs already exists. A one-year ahead EUA put would expire without being used if prices remained above the strike price. However, if the spot EUA price was below the strike price at the maturity date of the option, the put could be cash-settled for the price difference. The GAAUs could then be sold in auctions at a price close to the EUA price, and the revenue from the put option would make up the shortfall that would otherwise occur in meeting the revenue goals. However, the cost of buying an option (the "premium") and the limited liquidity of the options market, especially at longer maturities, may impair the extent to which options can be effectively used to protect against general declines in carbon prices.

In buying an option, the risk of loss is limited to the premium that is paid. Other derivatives could also be used, but would entail greater risk. For instance, GAAUs could be sold for delivery in the future. Typically, in a forward or futures contract, the buyer only needs to put up part of the price in advance (the "margin"). To ensure that the buyer will perform, the margin is increased if prices fall. However, if prices fall enough, the buyer will give up his margin and walk away from the contract if it is cheaper to get the instrument in the spot market. Thus, if GAAUs were sold through forward contracts, the counterparty (buyer) may fail to perform and the sale of GAAUs might never take place. However, the seller would at least have earned something by keeping the margin that the buyer paid. Given the fiduciary responsibility to governments around the world, however, it is advisable to avoid taking sizable risks with such derivative contracts.

5 Including the US in the Program

As a non-ratifier of the KP, the US does not have AAUs that can be drawn upon for international auctioning. Even if it does not take a commitment at Copenhagen involving submissions of AAUs to an international enforcement body, the US could potentially participate in the Norwegian revenue generation scheme through other means. One option would involve annual budgetary appropriations. Other alternatives are suggested by the Waxman-Markey bill, which recently passed the House of Representatives. Similar bills are now being developed in the Senate.

5.1 Overview of the Waxman-Markey Bill

The Waxman-Markey bill, H.R. 2454, would impose a GHG emissions cap on sectors representing about 87% of US emissions. The emission cap would be phased in across economic sectors between 2012 and 2016 and would result in emissions a few percent below the 1990 level in 2020, about 30% below in 2030, and 80% below in 2050. (Discounting of international offsets and set-asides for a supplemental program for reduced deforestation would imply larger reductions.)

The Waxman-Markey bill (W-M) states that it is US policy to "work proactively under the [UNFCCC]" to reach international agreements to reduce GHG. In that context, other specific provisions of the bill suggest the possibility of US participation in an international resource generation effort through various means discussed below.

5.2 US Firms as Potential Buyers of AAUs

W-M allows firms to use international emission allowances to meet their domestic compliance obligations if the Administrator of the Environmental Protection Agency (EPA), in consultation with the Secretary of State, qualifies the international cap-and-trade program as being at least as stringent as the US program. The allowances cannot be offset credits, but must be issued to meet mandatory absolute tonnage limits. The criteria for "stringency" are not fully specified in the bill, but include MRV, enforcement, offset quality, and offset limits. If the EPA qualifies the successor to the Kyoto Protocol under this provision, US firms would be able to use AAUs to meet their domestic compliance obligations. Therefore, they would be potential bidders in an auction of AAUs.

Of course, US firms would buy AAUs only if their price was less than the price of an allowance in the domestic program. W-M places a minimum price on the domestic auctions of allowances at US$ 10 in 2012 (in 2009 prices). The minimum price then increases by 5% per year plus the rate of inflation. However, there is no guarantee that the price of allowances in the US will exceed this minimum auction price. Over 80% of the allowances will be distributed for free directly to recipients in the first decade or so of the program. Also, up to 2 billion tons of emissions can be covered with offset credits under W-M (which represents about one-third of the emissions of covered firms in 2005). If a large amount of offset credits are used in the early years of the program, the allowance price in secondary markets could conceivably fall below the auction minimum. The draft legislation does not yet specify what happens to allowances that cannot be sold at the minimum price in auctions.

The EPA forecasts a US allowance price under W-M of a little over $12 in 2012 (in 2009$), reflecting a projection of about 1.5 billion of offsets per year (largely, international offsets). EPA assumes that the allowance price will rise by 5% per year after inflation (the same rate as W-M use to grow the minimum auction price). Thus, it appears that US carbon prices would be well below those in Europe under the W-M bill.

If the EPA qualifies the Kyoto-successor program and US allowance prices do exceed the price of AAUs, US firms would be buyers of AAUs. If US firms use the AAUs for compliance with the domestic program, W-M requires that those AAUs be retired from further use in the international cap-and-trade program. Thus, the purchases of AAUs by US firms would in effect tighten the emission caps on the Parties to the Kyoto-successor agreement. The purchases would add to the pool of compliance instruments in the US domestic system, thereby lowering to some extent the average price of US instruments.

5.3 US Allowance Value for International Adaptation and Clean Technologies

W-M allocates a percentage of domestic allowances for the purposes of international adaptation and clean technology deployment, which could be a means by which the US contributes to some of the purposes of the Norwegian proposal.

Under W-M, the percentage of allowances for each of these two purposes is 1% for 2012 through 2021, 2% for 2022 through 2026, and 4% for 2027 through 2050. The absolute amount of allowances for the sum of these two purposes averages around 100 million per year for the 2013-2020 period. At an average allowance price of about $15, the average annual market value would be $1.5 billion. Only a portion of that, however, could potentially be distributed through international institutions linked to the UNFCCC.

The legislation indicates that these allowances can be distributed either bilaterally or through multilateral funds or institutions linked to the UNFCCC. The Secretary of State has the lead responsibility for deciding on the split between bilateral and multilateral channels, and also oversees the distribution through international funds or institutions. W-M specifies that 40% to 60% of the allowances for international adaptation be allocated to international funds or institutions. (The portion of clean tech allowances allocated through that channel is not specified.) The allowances allocated through the bilateral channel are to be administered by the US Agency for International Development (USAID).

If a new institution were created to auction AAUs, the US could potentially allocate some of these international adaptation and clean tech allowances to that institution. Other allowances could be provided on a bilateral basis. Both types of contributions could represent part of the US obligation under the Bali Action Plan to provide financial assistance for NAMAs in DCs.

5.4 US Allowance Value for Supplemental REDD

One of the goals of the Norwegian proposal is to increase the funding available for reduced emissions from deforestation and degradation (REDD). Under the W-M bill, some REDD activities could earn offset credits, but an offset crediting mechanism would not be part of the Norwegian initiative. The bill also establishes a supplemental program for REDD activities that could potentially be linked to the Norwegian scheme. The supplemental REDD program is initially designed only to support reduced emissions from deforestation, but the EPA could expand the scope to include the prevention of forest and land degradation and the preservation of peatlands and wetlands.

The supplemental REDD program sets aside allowances from within the domestic emission cap for the purpose of achieving reduced emissions from deforestation in DCs. The set-aside is 5% of the allowances from 2012 through 2025, 3% from 2026 through 2030, and 2% thereafter. For the 2013 to 2020 period, the average amount

of allowances set aside for this program is around 250 million per year with an estimated average market value of about $3.25 billion.

The EPA, and in some cases USAID, would distribute these allowances with the concurrence of the Secretary of State to DCs, to international funds established under an agreement to which the US is a party, or to other private or public groups. W-M specifies a range of REDD activities that would qualify and the eligibility standards to be followed by the EPA, USAID, or an international organization receiving allowances under the program.

Given the size of this supplemental REDD program, especially between 2012 and 2020, allowances from this source could substantially boost the US participation in the Norwegian initiative. To take advantage of this opportunity for including the US, the allowance value from this source would need to be committed to REDD programs that meet US criteria.

5.5 Allocating Revenues from Domestic Allowance Auctions

The W-M bill does not provide for use of the revenue from the auctioning of US allowances for international climate change activities. Allocating auction revenues would likely require annual budgetary appropriations, similar to other budgetary legislation. The procedure of providing allowances directly to international entities evidently avoids that administrative hurdle. Under W-M, the international entities that receive support through allocations of US allowances are nevertheless allowed to consign their allowances to the EPA for inclusion in the EPA's auctions of allowances. Using this procedure for the allocation of allowances to an AAU auction facility has other advantages as well: If the US instead contributed to the Norwegian scheme merely by allocating revenue from domestic auctions, the EU might choose to contribute in a similar manner and that would undermine the entire concept of auctioning AAUs.

5.6 Allocating Domestic Allowances to an AAU Auctioning Body

As noted above, the Waxman-Markey bill provides funding for international adaptation, clean technology, and REDD—not through auction revenue—but rather through allocations of domestic allowances. The total amounts allocated for such purposes average about 350 million allowances per year between 2013 and 2020. At an estimated allowance price of about $15 over that period, this would amount to about $5.25 billion per year. Some of those allowances could potentially be transferred to an AAU auctioning facility to be used for these purposes and to support the specific international mechanism created for the revenue generation program.

As noted above, under W-M, forecast prices for US domestic allowances for the 2013-2020 period are well below forecasts of EUA prices. If GAAU prices turn out to be fairly close to EUA prices, that would raise the question as to whether the US should contribute a greater number of its domestic allowances to this resource generation effort to take account of the price differences. The adjustment for prices

could be undertaken in advance, based on forecasts, or after the fact, based on realized prices. If actual prices were used, the adjustment might vary year to year. For instance, if the price of AAUs was twice that of a US allowance in one year, the US might be expected to provide double the amount of domestic allowances for that year. If AAUs dropped to half the price of a US domestic allowance in a subsequent year, the US might be expected to contribute only half the notional domestic allowances for that year. The W-M legislation does allow some discretion to the US Secretary of State to adjust the amount of allowances allocated to international institutions within some limits.

Because of the limited discretion to vary the number of allowances dedicated to the purpose, the US would not likely be able to commit to a fixed amount of revenue in the form of domestic allowances. However, if it made a financing pledge, it might be able to supplement allowance allocations with domestic appropriations. The US also would not likely make an advance allocation of several years of its domestic allowances for the purpose. If allowances for several years ahead were released all at once to the AAU auction agency, the timing of the release of those allowances might not correspond to the needs of US compliance entities.

In sum, a variety of means could potentially be used to allow for US participation in the Norwegian auction proposal even if the US does not take a KP-like commitment and accept an AAU trading regime. However, the realization of some of those possibilities depends on the passage of legislation establishing a US cap-and-trade program and also on administrative decisions by agencies entrusted with implementing such a program. Aside from the US, other non-KP countries could also be encouraged to participate to the Norwegian initiative, either through budgetary allocations or contributions of allowances from domestic cap-and-trade programs.

5.7 Comparability of US and KP-country contributions

If a given percentage of AAUs were allocated for auctioning, how could a comparable contribution be determined for the US? One possible metric would be for the US contribution to be based on the level of its domestic emissions relative to the aggregate emissions of KP countries, net of any use of offsets or allowance banking. For instance, under W-M, the sectors entering the carbon trading program are phased in between 2012 and 2016. Covered entities for 2012 and 2013 represent 66.2% of total US emissions; those for 2014 and 2015 represent 67.6% of emissions, and those for 2016 and thereafter are 84.5% of emissions. (A separate program for controlling HFCs accounts for another 2.5% of total US emissions.) Dividing the carbon trading allowances in each year by the above percentages gives a rough estimate of the annual US emissions cap (ignoring international set-asides, discounts on international offsets, and the effects of banking). As shown in the third column of Table 8, this amounts to an annual average of about 6.6 billion tons for the 2013-2020 period, roughly two-thirds of the estimated emission targets for KP countries shown in Table 2.

Table 8
Allowances and US Emissions under the Waxman-Markey Bill

	Total Domestic Allowances (millions)	Multiplication Factor	Total Tons (mns.)
2013	4,544	1/.662	6,864
2014	5,099	1/.676	7,543
2015	5,003	1/.676	7,401
2016	5,482	1/.845	6,488
2017	5,375	1/.845	6,361
2018	5,269	1/.845	6,236
2019	5,162	1/.845	6,109
2020	5,056	1/.845	5,983
Total	40,990		52,984
Average	5,124		6,623

For each percentage point of allocations of AAUs for auctioning by KP countries, therefore, a matching US contribution would be about 66 million allowances per year, assuming no adjustment for relative prices. This is well within the 350 million of domestic allowances that the US would contribute to international adaptation, clean technology, and the supplemental REDD program under W-M. However, a price adjustment could have a large effect over the 2013-2020 period. An average GAAU price of about €40 would amount to about $58 at current exchange rates. That would be nearly four times the estimated US allowance price of about $15 between 2013 and 2020. If this price adjustment were made, the US might have to contribute nearly 270 million domestic allowances per year to match each percentage point of allocations of AAUs for auctioning.

It was estimated above that, for each percentage point of AAU allocations to auctioning, GAAU revenue could amount to about $5.5 billion per year over 2013-2020. If the US also contributed an allowance *value* (implicitly adjusting for any price differences) based on the comparability of its emission cap relative to that of KP-countries for this period, another $3.7 billion or revenue per year would be raised. Thus, the total revenue would amount to about $9.2 billion per year for each percentage point of AAUs allocated for auctioning. Unless US allowance prices proved to be higher than now foreseen, the US would have to go beyond the provisions of the W-M bill to match an allocation of several percentage points of AAUs for auctioning.

Of course, there are considerable uncertainties regarding the price forecasts for both US allowances and GAAUs. In particular, the EPA's forecast of US allowance prices depends on a fairly plentiful supply of offsets, which might not materialize in the amounts assumed. The forecast of GAAU prices also depends in part on a link between the EUA and GAAU markets, and on the uncertain availability of offset credits for Kyoto countries.

Of course, if the US carbon market was linked with other carbon markets around the world, carbon prices would tend to be equalized and adjustments would then no longer be needed for relative price differences. However, the linking of cap-and-trade systems and the achievement of equality among different carbon instruments requires overcoming numerous hurdles that have been discussed at length elsewhere (see, e.g., Jaffe and Stavins, 2008).

6 Institutional Architecture

Before considering the institutional architecture that may be appropriate to implement auctions of AAUs, it is instructive to consider the work that has been done to establish auctions of GHG allowances in the United States and the EU. In addition, the International Climate Action Partnership has brought interested parties together to review alternative procedures for conducting auctions of GHG emission allowances (ICAP, 2008).

6.1 Emission Auctions in the United States

In the U.S., a small amount of allowances for emissions of Acid Rain pollutants have been auctioned once per year since 1995. The Chicago Board of Trade conducted these auctions (at no charge) for the EPA until 2006, when the EPA assumed direct responsibility for them. The EPA retains a private firm to assist with the information processing associated with the auctions. The total value transacted in these auctions is fairly small (about $9.6 million in 2009) and the procedures are not especially relevant to the auctions of GHG allowances, which may involve much larger volumes and a broader potential range of participants.

Auctions of GHG emission allowances were initiated in 2008 by the Regional Greenhouse Gas Initiative (RGGI). RGGI is a CO2 cap-and-trade system for electricity producers in ten northeastern states. The states have set up a non-profit corporation ("RGGI Inc.") to implement the program. The corporation is responsible for allowance tracking, implementing the auction platform, conducting the auctions, reviewing offset applications, and evaluating possible changes in the program. The Board of Directors of RGGI Inc. consists of the heads of the energy and environmental agencies of each of the states.

Nearly all of the RGGI allowances are auctioned. The auctions are conducted on a unified basis, jointly for all the states, but the individual states decide on the quantity of their allowance allocations that will be offered in each auction. Auctions are scheduled quarterly (the first was held in September 2008). A uniform-price auction is used with a single round of sealed bids. The program allows the possibility of later transitioning to auctions with multiple rounds of ascending-price bidding, if that is deemed necessary in light of market conditions.

Any applicant that meets the qualification requirements may participate in bidding. The applicant must establish an account in the allowance tracking system, which may be a general account or a compliance account specific to a particular state. The application form requires disclosure of the bidder's business and of any corporate or bidding associations, as well as any past legal infringements. Prior to each auction, the applicant must file an intent-to-bid application and must post financial security to cover its bidding in the form of cash, bonds, or letters of credit. Using this information, RGGI Inc. pre-qualifies bidders for each auction.

A related group of bidders may not purchase more than 25% of the allowances offered for sale in an auction. The minimum lot size for bids is 1,000 allowances. Allowances are offered subject to a minimum ("reserve") price (initially $1.86). The reserve price is adjusted over time for inflation, or it may be set equal to 80% of the secondary market price of allowances, if market data are deemed adequate. (So far, the market data have not been seen as adequate for this purpose.) Future allowance vintages (up to four years ahead) are sold in separate auctions conducted at the same time as auctions of current vintages. The cumulative limit on advance sales is 50% of a state's allocations for any year.

A public notice of the auction is posted on the web at least 45 days before the auction. It indicates the amounts to be auctioned and the reserve price, and also provides a detailed description and schedule of auction events. Webinars and seminars are then arranged to train bidders in auction procedures and in the use of the auction platform.

RGGI states have retained an experienced, independent firm to monitor auctions and subsequent market activity. The firm observes the conduct of the auction qualification process and the auctions themselves. It reports on whether each auction was conducted in accordance with the established regulations.

Bidders have an interval of three hours within which they may submit their bids to the electronic platform. RGGI Inc. staff report the result to their Board and the participating states must approve the auction outcome. The clearing price is then posted on the web within two days of the auction. Funds are drawn from the financial security provided by the successful bidders immediately after the clearing price is posted. The allowances are transferred to the bidders' accounts in the allowance tracking system a few days later.

The auction results are reported by the monitoring firm and made public by RGGI Inc. The reports balance two objectives: transparency on one hand and, on the other, the confidentiality needed to maintain auction participation and prevent manipulation. The reports include information on the clearing price and the range and average of bid prices. They indicate the quantity of allowances given to each bidder (without naming names) and the quantity of bids (both overall and by compliance entities in aggregate). The reports also list the firms (or individuals) that completed intent-to-bid forms for the auction. However, the amounts bid at each price and the bids of and awards to particular firms are not disclosed. That information is thought likely to

promote collusive or other manipulative behavior. Indeed, it is forbidden for bidders to reveal any information about their bidding strategy, bid prices and quantities, and posted financial security.

6.2 Auctions in the EU

In the EU ETS, allowance auctions have been initiated by the U.K. and Austria. The amounts are still small, with the U.K. having issued only 17 million allowances and Austria just 400,000 through June, 2009. A few other EU countries are preparing for future auctions. In addition, Germany and Ireland have sold allowances through brokers.

The U.K. uses a "primary participant" model for its GHG auctions. In this approach, participation in auctions is limited to a select number of well-established financial institutions. Others interested in bidding must channel their activities through the primary participants. Thus, the primary participants bear the burden of pre-qualifying other potential bidders and insuring that such indirect bidders post sufficient collateral to honor their bids. This approach is often used in the sale of government bonds. The U.K. GHG auctions also allow those bidding for less than 10,000 allowances to submit non-competitive bids, which need not go through the primary participants. The non-competitive bidders are automatically awarded the allowances they seek at the clearing price of the auction.

EU allowance auctions are expected to pick up substantially after 2012. The European Commission (EC) recently issued a consultation paper on options for the design and implementation of auctions in the post-2012 period (EC, 2009). After analyzing the comments it receives, the EC expects to issue a draft regulation for auctions by the end of 2009.

The consultation paper discusses alternative levels of centralization of auction processes, intermediaries needed for implementation, and detailed options for auction procedures. The centralization issue could also be relevant for auctions of AAUs. A fully decentralized approach could imply auctions in each of the countries that participate in the EU ETS, which would involve multiplication of the substantial upfront and ongoing transaction costs of conducting and participating in auctions. It could also result in poor participation in some auctions and increase the risks of manipulation.

If a small, plural number of auction sites were used, some coordination would still be needed, at least as regards auction schedules and quantities. In addition, the degree of harmonization of pre-qualification and financial surety (collateral) requirements, other auction regulations, and information platforms and settlement systems would need to be worked out. Despite these complications, multiple auction sites might be chosen because of differences in languages and in customary procedures for pre-qualification and collateral.

One partial decentralization option could be considered as a candidate for both EU allowance and AAU auctions. In this alternative, a centralized information platform could be used to receive bids and run the algorithms that determine auction outcomes. However, within some overall guidelines, each country could be allowed to pre-qualify its own resident bidders and to check on the adequacy of the posted collateral. Each country could then provide a guarantee to the central auction facility regarding the financial performance of its bidders. That is, if a bidder's collateral proved to be insufficient to cover the amount of its bid, the country itself could be required to purchase the allowances at the given auction price.

The EC consultation paper also mentions the option of conducting auctions through organized market exchanges. The members of an exchange would then act as the primary participants in the auction. The exchange would already have considerable financial information about them. Moreover, exchange members typically have established procedures for processing market orders for third parties. The exchange platform and the associated clearing arrangements could also perhaps be modified to handle auctions, thereby saving some of the costs of establishing an entirely new framework for auctions. However, a selection would need to be made among the many possible carbon and commodity exchanges. Also, guidelines would have to ensure that the selected exchange(s) and the exchange members do not earn rents from the AAU auction role.

6.3 Comparing GAAU auctions with those of the EU and RGGI

Auctions of GAAUs will have some similarities and differences with those of the EU and the RGGI program. The similarities include the fact that GHG emission permits are involved and the auctions will be carried out for several different government bodies. Also, if GAAUs can be used for compliance by private firms in the EU ETS, they will be closely linked to that market.

However, the participants in GAAU auctions may differ somewhat from those in EU auctions (or RGGI), as they would potentially include representatives or agents of several national governments outside the EU. Also, the share of overall AAUs that will be auctioned will be very small relative to the shares of auctioning in RGGI or in Phase III of the EU ETS. It will therefore be more difficult for parties to corner the market in AAUs through bidding in auctions. For this reason, the purchase limits in auctions of GAAUs, if any, need not be as strict as those in RGGI or the EU ETS. In addition, given the fact that some governments may prefer to make confidential bids for GAAUs, the beneficial ownership interests of bidders might need to remain undisclosed to improve marketability of the GAAUs.

6.4 Institutional Structures to Implement AAU Auctions

This section of the report specifies in broad outline the types of institutions that might be needed to implement international auctioning.

6.4.1 The Overall Governing Body

As a creation of the UNFCCC, the overall responsibility for the AAU auctioning facility would naturally fall to the COP. The COP (or other governing body) would need to take responsibility for shaping the proposal through multilateral engagement and for creating the institutional structures needed for its implementation. This would involve at least the following steps:

1. Agreement on scope: A multilateral agreement is needed regarding the mandate for the uses of funds raised by AAU auctions (potentially including capacity building, adaptation, REDD, nonmarketable mitigation activities in DCs).

2. Assessing potential funding requirements: Some working estimates are needed, even if subject to considerable uncertainty, of the potential size of funding needs and when they may materialize.

3. The level of contributions: As discussed earlier, the level of contributions of AAUs to the auctioning program (and the potential contribution from the US or others) would need to be specified.

4. Institutional architecture: The institutions needed to implement AAU auctions would need to be specified.

5. Implementation: The detailed responsibilities and initial workplans for implementing institutions would need to be specified. Memoranda of understanding may need to be written to coordinate the roles of specific implementing agencies.

6.4.2 Key Roles for Downstream Implementation

The COP would not itself be able to carry out the full range of functions needed to implement AAU auctions. A Multilateral Auction Facility (MAF) could be created for the purpose, either as a revenue generating function within an existing agency or as a small, new institution. For instance, the MAF could operate through a trust relationship with an international development bank, similar to that between the Global Environment Facility (GEF) and the World Bank. Indeed, the MAF could even be a new resource mobilization function within the GEF or the Adaptation Fund. Alternatively, the MAF could be located within a new institution created under the CA. For instance, under the CA, a new Facilitative Mechanism may be established to match NAMAs with financing. Also, a Multilateral Fund may be created with several "windows" for various climate change activities in DCs.

Given the limited and specialized functions involved in conducting auctions, however, it may be preferable to create the MAF as a new legal entity. A new entity does not necessarily mean the creation of a large staff. The MAF might only need a small secretariat that would contract with other institutions to perform the details of its

functional responsibilities. To preserve the notion of a small staff focused mainly on resource mobilization, the MAF should probably leave it up to other institutions to identify and implement projects for capacity building, adaptation, REDD, and non-marketable mitigation in DCs. The MAF would then merely allocate a share of the funds it raises to other UNFCCC agencies, or international development institutions, which would carry out the selection and investment in specific projects and programs in DCs.

Under this approach, the COP would specify the institutions to which the MAF would channel the funds that it generates, perhaps using a formulaic method. The MAF would then concentrate on raising funds and related treasury operations. To conduct auction operations, the MAF would still need to oversee development of an automation platform to facilitate auction bidding, determine which bidders were awarded GAAUs and how much they were awarded, and provide reports on the auction results. With assistance from outside expertise, it would need to determine which methods would be used to conduct auctions (e.g., sealed or open bidding, single or multiple rounds of bids, uniform or pay-your-bid pricing). It would also need to develop policies and procedures for pre-qualifying bidders, for financial collateral from bidders, for minimum auction prices and limits on auction purchases (if any), and for the information to be released after the auctions.

As part of its ongoing operations, the MAF would have to arrange for the performance of the following key roles: an auctioneer, a carbon market operator, a monitor, a treasurer, and a coordinating Board. The duties involved in these roles, and the possible outside agencies that could help perform them, are discussed below:

1. Auctioneer

Organizing and conducting auctions requires specialized expertise. Auctions for the MAF will be especially challenging given the potentially wide range of different participants and financial securities that may need to be accepted. The Auctioneer will be responsible for establishing auction facilities, disseminating information about the auctions, training potential participants in use of the information platform, pre-qualifying bidders, assessing the value of the collateral posted by bidders, deciding on the awards of GAAUs, cashing the collateral and arranging for transfers of the GAAUs, and providing information about the auction results. The Auctioneer could potentially be assisted in the pre-qualification of private bidders and evaluations of their collateral postings by participating countries. Collateral evaluations could be waived, for instance, if countries provided guarantees for bidders within their jurisdiction.

The MAF secretariat could potentially contract with a wide range of private and public institutions to act as the Auctioneer, including international development banks, private exchanges or specialized firms, or a new agency that may be created to conduct auctions for the EU ETS. As mentioned above, the EU ETS is considering whether to conduct auctions on a centralized basis. If it does, the

centralized Auctioneer created for that purpose could be a good candidate for conducting GAAU auctions as well. Conceivably, private firms in the EU ETS could be major participants in both types of auctions. However, if the EU ETS conducts auctions on decentralized basis, the MAF would likely need to look elsewhere for an Auctioneer. One alternative would be for the MAF secretariat itself to act as Auctioneer, while outsourcing to experienced private firms the creation of the information platform and systems needed to run the auctions. This alternative would resemble the role played by RGGI Inc.

2. Carbon Market Operator

The Carbon Market Operator would be responsible for assessing the state of the carbon market and conducting any non-auction sales of GAAUs or derivative transactions. It would provide market intelligence that would contribute to decisions about the amounts to offer in each auction.

The MAF secretariat could contract with international development banks or other agencies to play the role of Carbon Market Operator. For instance, as mentioned earlier, the World Bank plays such a role as Trustee for the Adaptation Fund and other environmental funds.

3. Monitor(s)

The MAF would require one or more Monitors to assess the performance of the Auctioneer and Carbon Market Operator and ensure that they comply with the policy objectives. These could involve internal audit functions or, more likely, third-party reviewers. The work of a Monitor requires in-depth knowledge of the relevant fields; it resembles an audit function but goes beyond the review of financial statements. Separate institutions may be needed to monitor auctions and carbon market activities. The reports of the Monitor(s) would go to the overall authorities, including the COP, and most of these reports should be released to the public. As an example, RGGI Inc. contracts with a private firm to monitor each auction and provide public reports on the findings.

4. Treasurer

Once the funds have been raised by the Auctioneer and Carbon Market Operator, the Treasury function needs to be performed. Funds need to be invested in safe, short-term assets. The funds need to disbursed as needed for the ultimate purposes of the MAF (capacity building, adaptation, REDD, and non-marketable mitigation activities). It is assumed here that the MAF would disburse funds to other institutions that would have responsibility for carrying out these ultimate purposes. The policies for deciding on how much should be allocated to which purposes and the requirements and timing of release of funds for those purposes would need to be set by the COP or the MAF Board (described below).

The MAF could again potentially contract with international development banks to perform the Treasury functions. For example, this is part of the Trustee role that the World Bank plays for the Adaptation Fund.

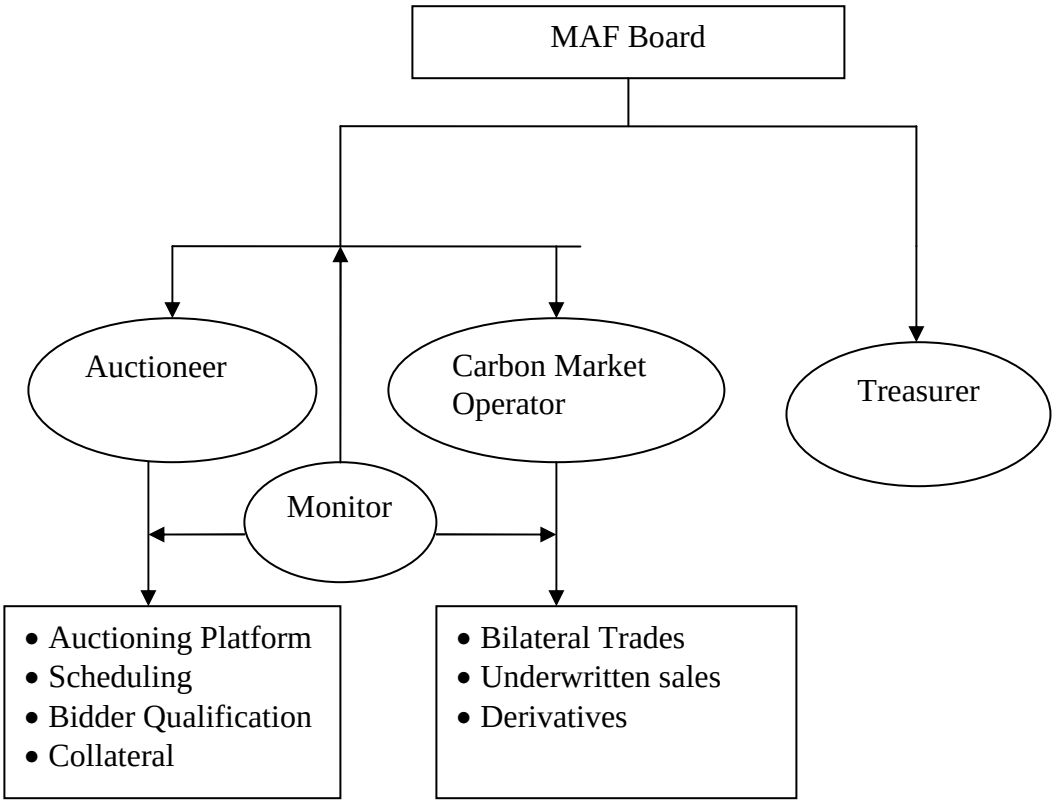
5. Board

The COP should decide on the powers to be authorized for the MAF Board, which would be written into the legal charter for the MAF. These powers might include specifying the detailed policies within which the above roles would be performed. The Board could consist of representatives from governments of both donor and recipient countries, along with regulators from cap-and-trade systems linked to this mechanism. The Board should be responsible for the following tasks:

a. Setting overall policies within which the above roles are performed.
b. Coordinating, with the help of the MAF secretariat, the work of the Auctioneer, Carbon Market Operator, Monitors, and Treasurer.
c. Evaluating the results of the program.
d. Liaison with the COP and the participating countries.

A schematic diagram of the responsibilities performed by the MAF is shown in Figure 2 below. It is important to keep in mind that many of these activities may involve contracts with outside organizations rather than the creation of a new bureaucracy.

Figure 2



7 Summary Conclusions

The main conclusions of this report are as follows:

1. Auctioning AAUs could make a substantial contribution to the financing gaps for capacity building, adaptation, REDD, and mitigation activities in DCs. If AAU auction revenue were provided to finance NAMAs, they could help Annex 1 countries meet their commitments under the Bali Action Plan and potentially help complete a climate agreement at Copenhagen.

2. AAUs provided for auctioning would be more marketable than the AAUs allocated directly to countries. They would represent the collective ownership of all parties taking KP-like commitments. Auctions of such AAUs would not require Green Investment Schemes to ensure environmental benefits. Auctioned AAUs could therefore be called generic AAUs, or GAAUs. In international and national registries, GAAUs should be distinguished from the AAUs allocated to countries, as the latter may be less marketable because of particular country "brands."

3. Kyoto countries that have domestic or regional cap-and-trade programs (e.g., the EU, Australia, New Zealand) should consider allowing private firms to purchase GAAUs and use them for compliance in their ETS. The countries collecting GAAUs from private firms could then use the GAAUs for their own compliance in the Copenhagen commitment period.

4. To ensure a strong and reliable base of funding, the Copenhagen Agreement could provide for issuance fees on the AAUs that are not auctioned but are directly allocated to countries. The issuance fees would be assessed only once, when countries receive their AAUs, not each time AAUs are traded in secondary markets. Carryover fees could also be considered for AAUs that are banked from the Kyoto period to the next commitment period.

5. The funding needs for capacity building, adaptation, REDD, and mitigation activities in DCs are very large, but the readiness of projects and the associated schedule of required disbursements are extremely uncertain. Funding requirements may swing substantially from one year to the next and remain difficult to predict. For this reason, the size of GAAU auctions should be decided close to each auction date, depending on funding needs and market conditions. Also, some advance sales of GAAUs may be needed to provide a base of liquid resources that can be used to meet unpredictable disbursement requirements.

6. If the United States does not take a KP-like commitment, it could nevertheless potentially contribute to this international resource mobilization effort through budgetary appropriations or allocations of allowances from its domestic cap-and-trade program. The GAAU auction agency could then sell the US allowances in the US domestic market.

7. The COP should take overall responsibility for the policy framework and institutional structures needed to administer the GAAU auctions and related resource mobilization activities. The auction functions could be carried out by an existing organization, a new entity created under the Copenhagen Agreement, or a small new specialized auction agency. Creation of a new legal entity to conduct auctions does not necessarily mean creation of a large staff. A GAAU auction agency would need a Board and a small secretariat, but it could contract with outside entities to help it conduct auctions, other GAAU sales operations, monitoring functions, and treasury activities.

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