



Operational Issues for a Sector-Based Approach: Questions and Answers

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This paper details the key set of questions to consider in defining the structure of a sector-based approach to the future international climate change system. This document should be read in conjunction with *The Sectoral Approach: A New Proposal for Stabilizing Global Emissions Post-2012 via Major Industry Sector Targets in Developed and Developing Countries*. In the sections that follow we identify the key set of questions, outline the options for how these questions could be answered, and provide proposed answers to these questions.

I. WHAT SECTORS PARTICIPATE?

One of the key questions in a sector approach is deciding which sectors participate since this influences the way such a program is structured. In deciding which sectors to include, we propose using the following factors.

- *Size of current and projected emissions levels* since the aim is to have a program that covers as much of global GHG emissions as possible to maintain the possibility of meeting aggressive atmospheric GHG stabilization levels.
- *Number of actors* since sectors with a smaller number of actors place a lesser burden on government resources since there are fewer actors to collect emissions data from and to regulate.
- *Data availability and transparency* since accurate data is critical in building confidence that regulatory goals are being met.
- *Cost-effectiveness of emissions reductions* since inclusion of sectors offering lower relative costs per ton reduces potential political opposition to regulation.
- *International competitiveness* since inclusion of all sectors involved in international trade can address concerns about potential industrial flight and help to create the proverbial “level playing field”.
- *Homogeneity of products or processes* since this simplifies the development of a single carbon intensity metric, the tracking of appropriate data on emissions and the assessment of appropriate control strategies.

I.A A PROGRAM FOR THE ELECTRICITY AND MAJOR INDUSTRY SECTORS?

We suggest that the program initially include the electricity and major energy-intensive industry sectors—electricity, iron & steel, aluminum, oil refining, cement, lime, and pulp and paper sectors—in the “no lose” GHG intensity targets defined in this paper. These sectors are characterized by: a relatively small number of entities¹; easier data collection²; relatively homogenous products, except in the case of oil refining and pulp & paper³; operate in international trade⁴, except in the case of electricity⁵; and combined account for a significant

¹ This is especially true compared to other sectors such as road transportation and land-use change where there are often a significant number of actors.

² This of course depends on which gases or activities are included for the sector. For example, collecting combustion data for each of these sectors is easier than process emissions data.

³ These sectors have some homogeneity of products, but there is variation due to, for example, the sulfur content and the demand for paper products.

⁴ About 30% of world steel production is estimated to be traded, only 6% of cement production is traded across borders, 77% of aluminum is traded; and only 3% of electricity (Watson et al., 2005).

share of emissions—approximately 33 percent of non-Annex I and 15 percent of global GHG emissions.^{6, 7} An additional factor driving the choice of sectors is a desire to include all sectors which are direct competitors in order to address concerns that the program may provide indirect incentives for a non-covered competitive product.

How are electricity and major industry sectors defined? There is no universally accepted definition of a sector and the existing GHG inventories (i.e., IPCC Good Practice Guidance and IEA CO₂ Emissions from Fuel Combustion data) do not, in all, cases break emissions into appropriate sector categories. Clear definitions of sectors would address concerns that companies may “re-orient” themselves in order to avoid participating in the program (e.g., by reducing their size to be below the threshold or slightly changing their activity). We propose using bottom-up definitions for the electricity and the major industry sectors in this proposal, which could be based upon the following criteria.⁸

- *Electricity*. Combustion facilities with a rated thermal input exceeding 20 MW.
- *Iron & Steel*. Facilities for the production of pig iron or steel (primary or secondary), with a capacity exceeding 2.5 tonnes per hour.
- *Oil Refining*. An industrial process plant where crude oil is processed and refined into petroleum products.
- *Cement and Lime*. Facilities for the production of cement clinker in rotary kiln with a production capacity exceeding 500 tonnes per day. Facilities with a lime production capacity exceeding 50 tonnes per day.
- *Pulp and Paper*. Facilities for the production of pulp from timber or other fibrous materials. Facilities for the production of paper and board with a production capacity exceeding 20 tonnes per day.

What emissions are included for these sectors? It is important to decide how the emissions for the particular sector are defined in order to understand which emissions data must be collected and which emissions are included in the sector’s target. This definition could include only direct emissions—e.g., direct fuel combustion⁹—or direct and indirect emissions—e.g., emissions related to offsite electricity production (WRI, n.d.). For some of these sectors a large share of emissions is related to electricity consumption, some of which is from off-site facilities. While it would conceivably be useful to include indirect emissions from off-site electricity consumption in the emission portfolio of the sectors, attributing the exact emissions from off-site electricity generation is very difficult given the issues surrounding “tracking electrons”. Therefore, we propose that only the emissions associated with direct combustion in the particular facility are included in the sector’s emissions since it is clearly preferable to rely on a program for the

⁵ While electricity is largely not an internationally traded commodity, a number of internationally oriented sectors rely on electricity to some extent for energy production there is a potential indirect effect on international competition related to participation of electricity.

⁶ If land-use change and forestry (LUCF) emissions are included in the totals, these values change to 21 and 12 percent, respectively (see Appendix A).

⁷ In 2000, these sectors from both Annex I and non-Annex I countries accounted for approximately 34 percent of global GHG emissions without LUCF emissions (see Appendix A).

⁸ These definitions are drawn from those in the European Emissions Trading System.

⁹ This means that only emissions from direct fuel combustion in these sectors will be covered. For example, the iron and steel sector will not include emissions related to electricity consumption in their operations since these will be covered in the electricity sector emissions.

electricity sector—as is proposed here—to capture emissions related to off-site electricity production.

Further decisions are required on which GHG emissions to include since some sectors produce a direct GHG emissions from on-site combustion as well as processes. Given the relative ease of calculating and tracking fuel combustion CO₂ emissions for the proposed sectors, it may be desirable to start with these emissions first.¹⁰ One notable exception may be to include CO₂ emissions from calcination in the cement sector since this is a sizeable share of the sector's emissions and is included in the approved CDM methodology for the cement sector.

I.B CAN A SECTORAL APPROACH BE APPLIED TO OTHER SECTORS?

In this proposal, other sectors—such as transportation, residential, and commercial, will be eligible to participate in project-based, “policy/program-based”, or “sector” CDM. For these sectors, therefore, the entire emissions reductions below their business-as-usual baseline will be eligible for sale, in contrast to the program proposed for the electricity and major industry sectors where only those reductions below the “no lose” target are eligible for sale.

A key question for further consideration is whether other sectors (or sub-sectors) could participate in a sector-based approach and what structure such a program would take in those sectors, since the structure proposed for the electricity and major industry sectors in this paper would likely not be directly applicable to other sectors.

Several sectors or sub-sectors seem potentially promising and warrant further consideration.

- Land-use change and forestry (LUCF)—accounts for 34 percent of non-Annex I emissions in 2000.
- Transportation, and passenger vehicles in particular—road transportation accounted for 13 percent of global GHG emissions without LUCF, 8 percent of non-Annex I emissions, and 17 percent of Annex I emissions in 2000.
- Agriculture, in particular animal manure handling or nitrogen fertilizer use—methane emissions from animals account for approximately 0.7 percent of global and non-Annex I GHG emissions in 2000.
- Energy consumption from appliances, or some select set of appliances.
- Methane from municipal waste—accounts for 0.4 and 0.6 of global and non-Annex I emissions, respectively, but also contributes to other factors (e.g., sustainable development priorities and health).

II. IS IT AN INDUSTRY OR COUNTRY-BASED APPROACH?

There are essentially two types of sector-based programs: country- or industry-based. In a *country-based approach* individual countries would be responsible for ensuring that the emission levels of the covered sectors meet the defined program goals/targets. Countries would also be

¹⁰ This approach has been undertaken in the EU Emissions Trading Scheme which only covers CO₂ emissions in its first phase.

responsible for reporting GHG emissions for the entire covered sector(s). In an *industry-based* approach a goal or target would be established for the entire sector's operations throughout the world (or some subset). Such an approach seeks to address oft-raised concern about leakage (e.g., firms moving operations from covered to non-covered countries) and competitiveness (e.g., one firm is covered, but its competitor is not) by including all the major actors in a sector in a similar manner.¹¹

We suggest that a sector-based approach be implemented on a country basis for a number of reasons. First, it may be possible to cover a significant amount of the operations for particular sectors through the participation of a relatively small number of countries (Schmidt et al., 2005b). Therefore, it is possible to address concerns that all major competitors are included without the need to cover global operations. Second, international law has no clear precedents for regulating specific industries on a global basis. In situations where a single industry is dealt with in an international treaty (e.g. ICAO, WMO), the UN agency develops standards but relies on individual countries for their adoption and enforcement. Countries have a much clearer legal ability to ensure that firms operating within their borders meet the program goals/targets. While it is possible that a new legal institution could be established for enforcing sector-wide targets (e.g., perhaps through a modified World Trade Organization approach), such an arrangement would likely require a lengthy and “painful” negotiation process.

III. WHICH DEVELOPING COUNTRIES PARTICIPATE?

The program will aim to include all the major developing countries for electricity and major industry sectors, but emphasis will be placed on encouraging the participation of countries representing a major portion of the sector's operations and emissions, particularly enough to address concerns over leakage and also address major operations for the particular sector.¹² The specific threshold is difficult to define, but significant coverage can be achieved in these sectors through the participation of a small number of countries.

- The number of non-Annex I countries required to participate in a program to cover eighty percent of non-Annex I emissions in the sector is relatively small: electricity (10), iron & steel (3), chemical & petrochemical (9), aluminum (4), cement & limestone (7), and pulp & paper (4) sectors could be achieved by the participation countries, respectively.
- Increasing the coverage to 90 percent implies increasing the number of countries involved: electricity (20), iron & steel (9), chemical & petrochemical (13), aluminum (6), cement and limestone (14), and pulp & paper (6) (see Appendix C for specific details on the countries and their individual shares). For all sector's in the proposal a program that covered the “ten highest emitting non-Annex I countries” for the sector would cover over 80 percent of the non-Annex I emissions for the sector. For some sectors, a much smaller number of countries (e.g., three for iron and steel and four for aluminum) would cover this level of non-Annex I emissions for the sector.

¹¹ It is important to note that the system does not necessarily address leakage where an entity slightly modifies its activities in order to avoid regulations.

¹² Leakage is a particularly relevant concern for the internationally oriented industries, but could also be a concern for the electricity sector since the price of electricity can have impacts on these and other sectors.

Since a limited number of non-Annex I countries account for a relatively large share of the global emissions for the sector, coverage of these countries would also cover a significant amount of the global sector-wide emissions. For example, a program that included the “top ten” non-Annex I countries (i.e., the ten highest emitting countries) for these sectors would account for electricity (32), iron & steel (39), chemical & petrochemical (36), aluminum (3), cement & limestone (52), and pulp & paper (21) percent of the sector’s global emissions.

IV. HOW IS THE “NO LOSE” TARGET ESTABLISHED IN DEVELOPING COUNTRIES?

The final sectoral GHG intensity pledge made by each of the participating developing countries (e.g., ten highest emitting for each sector) would result from a negotiation process between developed countries and each individual developing country. We envision a four step process for establishing an aggressive “no lose” target, as follows.

- Assessment and definition of energy-intensity benchmarks in each sector as a starting point for the negotiations.
- Non-annex I countries pledge an intensity level that they can meet on their own.
- Annex I countries, negotiate with these countries on specific financial and other support—through a “technology finance and assistance package”—to help the non-Annex I countries in the program go beyond their pledge levels.
- The ultimate “no lose” carbon intensity target for the country in a particular sector is defined based upon the combination of the country’s pledge and the impact of the agreed support from the “technology finance and assistance package”.

IV.A IS THE “NO LOSE” TARGET A HARD CAP OR INTENSITY LIMIT?

We propose that the “no lose” targets in developing countries be an intensity based target, while the targets in developed countries are hard caps (see section V).

IV.B WHAT WOULD BE THE BASIS FOR THE INTENSITY LEVELS AND HOW ARE THEY DEFINED?

The initial building block for this negotiation will be an expert assessment of benchmark *energy intensity* (e.g., Joules / ton of steel) levels for major processes within each selected industrial sector. This could be carried out by an international entity such as the International Energy Agency or by internationally selected expert institutes such as the Lawrence Berkeley Laboratory, the Dutch Centre benchmarking organization, or Tsinghua University. Having an independent entity define the benchmark could insure that the process of negotiation begins on a firm technical and economic basis, much like the experience of the European Union with the “Triptych” analysis that was the starting point for negotiations on burden sharing within the European Union prior to Kyoto.

Are the benchmarks tailored to energy mix? Since setting an intensity target based upon energy intensity eliminates differences that are the result of fuel mix in a sector or country, we propose that the benchmarks be based upon energy intensity. The energy intensity benchmarks can then be refined to a GHG intensity through negotiation with each country.

How many benchmarks are developed for each sector? We propose that the independent entity define a limited number of benchmarks that reflect the major processes in a sector. From a purely engineering standpoint, it is often desirable to have a large number of benchmarks to reflect the entire range of differences in a sector. However, developing and then using a large number of benchmarks in an international negotiation process is bound to be cumbersome and possibly a barrier to effective negotiation. The goal is to define a large enough number of benchmarks to reflect the engineering differences between facilities, but not so many that it becomes burdensome for use in an international negotiation process.

What technology type is chosen for the basis of the benchmarks? The specific intensity level chosen for the benchmarks could be based upon commercially available technology or technology which is still in development. In addition, the benchmarks could be based solely upon what is feasible from a technical and engineering basis—a so-called “best available technology/technique” (BAT) or also combine engineering feasibility with cost—a so-called “best available economical technology/technique” (BAET). We propose that the independent entity define separate benchmarks for BAT and BAET using commercially available technology. The BAET benchmark would differ from the BAT benchmark in that it would use predefined economic thresholds (e.g., two year payback or \$5 per unit of energy) in defining the level. It might be desirable to have a range of BAET benchmark levels reflecting economic thresholds in order to help facilitate discussion on the “no lose” target and the technology financing and assistance package.

How are existing and new facilities handled in the benchmark process? We propose that separate benchmarks be developed for new and existing facilities in each sector to reflect the differences between the technical availability of emissions reduction technologies, the cost of retrofit technologies versus greenfield facilities, and the degree to which existing facilities have been fully amortized.

Would the benchmarks be updated and how? Since technology is often changing on a continuing basis, we propose that the benchmarks be updated every seven years similar to CDM baselines which are updated every seven years.

V. WHAT ROLE AND IN WHAT FORM DOES TECHNOLOGY FINANCING AND ASSISTANCE PLAY?

A package of technology financing incentives will be proposed by Annex I countries and international financial institutions (IFIs) to help the eligible non-Annex I countries establish and meet more aggressive “no lose” targets that reflect both the development and introduction of more advanced technologies and a faster retrofit, retirement, or penetration of BAT at existing facilities. The current Group of Eight process is attempting to define such a package by next spring to finance climate mitigation and adaptation activities. There are a number of key questions.

A package of “technology finance and assistance incentives” will be proposed by developed countries, international financial institutions (IFIs)¹³, and export credit agencies (ECAs) to help the participating non-Annex I countries establish and meet more aggressive “no lose” targets that reflect both the development and introduction of more advanced technologies and a faster retrofit, retirement, or penetration of BAT at existing facilities. This new finance package would be designed to leverage private sector investment by combining new financing from developed countries with restructuring of existing financing mechanisms under IFIs and ECAs. Developed countries would offer new commitments of funding that could be used to write down the cost of new more costly climate-friendly technologies in key developing countries. The current Group of Eight (G8) process is working to define such a package by next spring to finance climate mitigation and adaptation activities and could serve as a useful model for how such a process could unfold.

It is envisioned that the negotiations could proceed along either a multilateral or a bilateral basis between individual developed nations and individual developing countries:

Multilateral. In this approach, Parties would provide commitments to a single multilateral entity (e.g., the World Bank Group or a designated regional development bank) that could manage the negotiations with each developing country. These could proceed along the lines of the current World Bank process with recipient countries—i.e., the Country Assistance Strategies and the ensuing identification of specific projects. A full suite of financing options through the various international institutions would be available and donor nations would likely be involved in the negotiations on the package and the ensuing strengthening of the “no lose” target.

Bilateral. Commitments on the type and amount of financial assistance and specific activities could be developed through bilateral agreements or agreements between groups of countries (e.g., the G8 or EU) and a particular developing country. The recent EU-China announcement to support the development and deployment of integrated gasification combined cycle and carbon capture and sequestration (IGCC-CCS) in China is one example of the type of activity that could occur.¹⁴ The principal advantage of this kind of approach is that it could explicitly include non-Kyoto countries in the process where they share an interest in seeing the deployment of particular technologies. The negotiation process could be more of a “market bazaar” approach where developed countries announce the available assistance—including what types of activities will be funded and the level of funding—and then individual developing countries signal their interest in specific announced activities and negotiate the implications on their “no lose” sector target. The model for this might be the “Methane to Markets” partnership where participating donor countries can offer widely different incentive packages that are not linked in any multilateral fashion.

How do you decide the scope of the package (e.g., money needed)? This assessment should be based upon a thorough bottom-up analysis of the financial and capacity barriers to meeting the BAT intensity level for new and existing facilities in each developing country. The current

¹³ Here we collectively refer to such institutions as the World Bank, International Monetary Fund, as well as, the regional development banks. Some authors collectively combined these Multilateral Development Banks with Export Credit Agencies when referring to IFIs.

¹⁴ For more information, see: http://europa.eu.int/comm/external_relations/china/summit_0905/index.htm.

World Bank effort to define the “gap” in financing for deployment of particular technologies in the five developing countries participating in the G8 process could be a start on this effort. Different financing tools would be used in different countries depending on the specific characteristics of their financial markets and the structure of the industrial sector involved.

What activities are supported and how? Since the aim of the technology financing and assistance package is to help developing countries meet more aggressive “no lose” targets, the program will want to support activities that remove the major barriers to greater penetration and deployment of carbon-intensity reducing technologies in the targeted sectors. In this regard, the program will likely need to contain support for demonstration and pilot projects, capacity building, and support for deployment. We propose that the package could include but not be limited to the following specific activities:

Demonstration and Pilot Project Grants. For technologies where field testing will better improve the technologies or where the technology has proven successful but not been tested in a specific developing country, financial and technical support would be provided for select demonstration and pilot tests of those technologies. For example, developed countries could provide financial and technical support for demonstration IGCC-CCS plants in developing countries with significant coal resources (e.g., akin to the recent EU-China announcement on supporting such a facility). The goal would be to finance the incremental cost beyond that of conventional technology and to rely on conventional private and public investment to cover the base cost.

Grants to Train Plant Operators to Operate Facilities at the Most Efficient Level. Since one of the barriers to the operation of the most efficient technologies in developing countries is sometimes the lack of training for facility operators, support would be provided to train facility managers.

Financing from Export Credit Agencies and International Financial Institutions for Deployment. This could take the form of a direct grant or an interest rate subsidy that would pay the additional cost of climate reducing technologies in these targeted sectors and make them competitive with other IFI and ECA projects when coupled with typical IFI and ECA financing. For example, estimated concessionary financing of \$8 to \$12 billion could expand renewable generating capacity in developing countries by 50 to 70 GW between 2000 and 2010 (Sussman and Helme, 2004). Since ECAs cover the investments of a significant amount of private foreign direct investment (FDI), this approach would leverage a much larger share of private FDI.

Special Lending Provisions from Export-Credit Agencies for Deployment. ECAs could also offer special lending provisions —such as extended payback periods, reduced fees or faster transaction processing, lower interest rate on loans, or lower premiums on loans—for emissions reduction technologies in this sector.

Soft Loans from International Financial Institutions. Soft loans could be provided for investments that help reduce the emissions intensity. A structure could be established where certain technologies receive a set arrangement for the “soft” component of the loan.

Grants for Deployment from International Financial Institutions. In addition to the soft loans provided by IFIs, these institutions could provide grants for specific activities which meet certain criteria, such as difficulty for project to generate a sufficient financial return to the recipient in a sufficient timeframe or for unproven technologies or approaches (e.g., pilot projects).

VI. HOW ARE EMISSIONS REDUCTION CREDITS GENERATED?

In the proposal, the GHG “no lose” intensity target becomes the emissions crediting baseline (e.g., ala the “without project” CDM baseline, adjusted to reflect local or regional fuel mix patterns) for developing countries. In effect, the emissions reductions beyond this target become Emissions Reduction Credits (ERCs) and are eligible for sale to Annex I countries. This occurs in the following manner.

- The total emissions and output (e.g., tons of cement) for each of the facilities in the country that meet the definition for the sector, described in I.A.1, are calculated at the end of the target demonstration period.
- These totals are used to calculate an average carbon intensity for all the facilities in the program (the “actual carbon intensity level”).
- The total ERCs generated are then calculated based upon the difference between the actual carbon intensity level and the countries carbon intensity target for the sectors multiplied by the actual output in the sector.
- The country may then decide whether and how to distribute the ERCs or the proceeds of the sale of ERCs to individual entities within the sector.

When are emissions reduction credits established? We propose that the system be designed in a manner that generates credits *ex-post* (i.e., after the fact) after the first two years of the compliance period and again at the end of the five year compliance period. Therefore, every two years the amount of ERCs generated are calculated, as described above, using actual emissions intensity and output. There are a number of reasons to calculate ERCs in this manner. This enables entities (e.g., countries or companies) to participate in the carbon market during the same compliance period that they make the reductions. It avoids any problems with enforcement against countries being required to make up shortfalls due to growth in operations or failure by legal entities in the country to meet the standards. Since this is designed as a no lose target, the requirement to make up ERCs would run counter to the basic philosophy of this system. This system does have the disadvantage of the “tragedy of the commons” in that a company who makes more reductions than required may not be rewarded because some of its colleagues have failed to meet their target. This can be taken care of through the design of the domestic regulatory structure where companies can be assured of rewards within the domestic system, regardless of the country as a whole’s overall performance.

How does the sectoral pledge and financing package relate to the CDM? In the developing countries which participate in this program (e.g., roughly the ten highest emitting per sector), the new pledge process would supplant the CDM in the sectors covered by the pledges. Since all facilities above a certain size in a given sector are covered by the sectoral pledge, ERCs are generated solely by exceeding the sectoral intensity level on a sector-wide basis. For sectors not

included in the pledge process, the CDM would continue as it has during the first commitment period or modified to include policy-based or sector-CDM, as discussed above.

For developing countries not included in the sectoral pledge process, CDM would continue as before with the exception that:

- The energy intensity benchmarks developed for the selected sectors would become a minimum threshold for determining CDM baselines for new facilities in those sectors globally.
- The CDM methodology panel process would continue to set precedents for the final determination of CDM project baseline methodologies in the pledge sectors, in that the carbon intensity determination would still be done on a project, country or regional basis as appropriate. This would allow differences in country or regional fuel mix to be reflected in baseline methodology determinations by the methodology panel as it is handled currently.
- The sectoral pledge process could lead to the creation of a new sectoral CDM process for countries not involved in the pledge process defined above.

VII. HOW DOES THIS SYSTEM APPLY TO ANNEX-I COUNTRIES?

As a part of this proposal developed countries adopt national fixed emissions limits (e.g., 30 percent below 1990 levels) for the entire economy.¹⁵ We propose that the benchmarks be used as a building block for setting the national absolute targets for Annex I countries in a similar manner to the “Triptych” approach.¹⁶ The Triptych was an analytic exercise developed to provide a starting point for the EU’s negotiations over burden sharing of whatever target the EU eventually agreed to in Kyoto.

We suggest that the starting point for the national target setting in Annex I countries would be to apply the energy intensity benchmarks developed by outside experts to each of these sectors in Annex I countries. Using this starting point, combined with negotiation—on such factors as industry structure, fuel mix, and cost of emissions reductions—national targets (i.e., the Assigned Amount Units, AAUs) would be built from the bottom-up. This would require decisions about the projected level of output in these sectors in order to develop absolute emissions levels for the Annex I national targets. It would also require some process or decision rule for the other non-trading sectors in order to develop economy-wide national targets.

For example, let’s say that the electricity benchmark is 2 tons per kWh and the country “Worldonia” is projected to have total electricity production in the compliance year of 100 kWh. Then Worldonia’s AAUs for the electricity sector would be 200 tons. The same approach would be taken for major industry sectors in the proposal and total AAUs from those sectors equals 150 tons. Then Worldonia’s AAUs for the electricity and major industry sectors would be 350 tons.

¹⁵ This is in addition to the role that Annex I countries play in the technology finance and assistance package.

¹⁶ A sector program could be used to develop an economy-wide emissions reduction program in a similar manner to the Triptych approach, where the level of reductions that can be achieved in a group of sectors are combined into an overall economy-wide target for the country (Höhne et al., 2004; den Elzen and Lucas, 2003; and Groenenberg, 2002).

Couple this with the proposed caps (reflected in AAUs) for the other sectors and you have Worldonia's economy-wide AAUs and emissions reduction aggregate cap. An iteration process would be required to reduce the individual sector targets to ensure that the overall emissions are at the level sought (e.g., 15% below 1990 levels). These sector emissions levels and the associated carbon intensity benchmarks will then be the basis for the national allocation plans to individual sectors in the countries.

VIII. ARE THERE ASSURANCES THAT A LEVEL PLAYING FIELD WILL EXIST AT THE END OF THE PROCESS?

One of the major concerns in any international agreement is that a “level” playing field exists between the operations in a given industry in one country and those in another. While this process begins with the same energy intensity benchmarks for new facilities in a given industry sector in all countries, will those be widely divergent by the end of the negotiating process? In all likelihood, the negotiated “no lose” targets adopted by developing countries will differ to some degree. This is consistent with the principle of common but differentiated responsibilities. Nonetheless, by using the same energy intensity benchmark in developed and developing countries as the starting point for the target setting process, there is assurance that a level of comparability exists between similar operations in developed and developing countries. The major difference lies in the fact that within Annex I countries, trading could result in facilities in a certain sector doing less than the benchmark level by purchasing additional allowances to offset the reductions not achieved through full implementation of the benchmark. At first glance, this might appear to violate the level playing field principle, but it must be remembered that in this proposal, developing country facilities face GHG intensity targets but not absolute caps, while facilities in a given sector in Annex I face hard caps but with the ability to trade to ease the limits to growth in absolute emissions that might flow. In sum, while this proposal will not produce a completely level playing field in a given sector, it moves the process post-2012 a long way in that direction by insuring that 80-90 percent of global operations in a given industrial sector are now part of a similar regime, albeit an incentive-based rather than mandatory regime in the major developing countries.