genan
Knowledge-based Recycling Concepts

CDM Executive Board
Mr. Martin Hession, Chairman
UNFCCC Secretariat
Martin-Luther-King-Strasse 8
D 53153 Bonn, Germany

17 March 2011

Call for Public Inputs

Further expansion of applicability of AMS-III.AJ "Recovery and recycling of materials from solid wastes"

Honorable Members of the CDM Executive Board,
Dear Mr. Hession,

Genan (www.genan.eu) is the largest recycler of scrap tires in the world. We are currently developing first-of-a-kind CDM project activities in Brazil and other developing countries, and have therefore been considering various methodological options, including expanding the applicability of AMS III.AJ. to include scrap tire recycling. We therefore welcome the opportunity to share our thinking on this subject with the CDM Executive Board.

Life-cycle analysis demonstrates convincingly the potential climate mitigation and integrated environmental benefits of recycling tires to substitute for virgin materials, as opposed to other end-of-life options, some of which have been considered as climate mitigation options themselves (e.g., combustion of scrap tires to fuel cement production).

1. Suitability of including other materials and project types under AMS III.AJ.

AMS III.AJ. quantifies greenhouse gas emissions reductions based on the difference in energy use for the production of plastic product/s from virgin inputs versus production from recycled material. We believe this is the correct approach, in general, to address climate mitigation by raw material substitution under the CDM.

For this reason, we believe that the more logical sectoral scope for this type of "material substitution" project activity is "fuel/feedstock switch". In fact, feedstock switch is a subset of the range of material substitution activities, so the title and description of the category might benefit from clarification and modification. This point is not just an "academic" issue: Characterizing products at end-of-life as "waste" runs counter to current efforts to introduce systems thinking into product policy and to promote a circular economy.

Genan Business & Development A/S . Jegindøvej 16 . DK-8800 Viborg . Tlf. +45 87 28 30 00 . Fax +45 87 28 30 30 . CVR.nr. 28 29 07 64

In our view, the current version of AMS III.AJ. is unnecessarily restrictive on several key points:

- Source of materials to be recycled: The current version of the methodology requires that the materials to be recycled be sourced from municipal solid waste (which has not already been segregated from the rest of the waste) and procured locally from sources located within 200 km of the recycling facilities. This rewards and can perpetuate discarding of products at end-of-life. The CDM should not require that garbage is first created as a prerequisite for undertaking material substitution activities under the CDM; rather, it should discourage useful materials from entering the waste stream in the first place, consistent with best practice waste management strategies and product policies. Given that the baseline scenario is virgin production of materials, there is no need to require that the recycling activity use materials from MSW. In our case, we will typically contract to obtain scrap tires before they enter the waste stream. Diverting the recyclable fraction from waste streams represents good practice in waste management.
- Eligible materials: So far, the methodology is only applicable to certain types of plastics. We do not believe there is any inherent reason to limit the methodology to any particular types or sources of recyclable materials. Our business will recover rubber, steel and textile from scrap tires, all of which can then substitute for virgin production or energy sources (in the case of textile), with GHG benefits.
- Project boundary: To be eligible, AMS III.AJ. requires that both the recycling plant and the virgin material production facility are within the project boundary and within 200 km of each other. However, many raw materials are traded as commodities, so it is neither feasible nor sensible to compare energy use for material recycling (which should be within the project boundary) vs. energy use for virgin production from a specific local facility. In many cases, it may be preferable to consider broader benchmarks for energy use in virgin material production.

2. Methods to show product equivalence of recycled and virgin materials

This topic is addressed for scrap tire recycling in the studies referenced in Footnote 1.

3. Default values for embedded emissions/energy in virgin rubber and steel

We support the use of conservative default values to determine carbon dioxide emissions reductions from scrap recycling relative to the baseline of virgin production. Such default values typically draw on life-cycle inventories compiled by industry associations and/or research institutions.

Genan Business & Development A/S has recently commissioned two independent analyses[1] that compare the impacts of three different end-of-life pathways for scrap tires:

---

[1] *Comparative life cycle assessment of two options for waste tyre treatment: Material recycling vs. co-incineration in cement kilns* (2009a) and *Comparative life cycle assessment of two options for waste tyre treatment: Material recycling in asphalt and artificial turf vs. civil engineering application for drainage layers in landfills* (2009b).

- Material recycling: Recycling of tires for use as an ingredient in rubber asphalt (75% fine fraction < 1.4 mm) and for use as an infill in artificial turf (25% > 1.4 mm)
- Civil engineering: Shredding of tires for use as a drainage layer in landfills
- Co-incineration: Combustion of tires as a source of energy and iron in cement kilns.

The LCAs were carried out by a team from the Copenhagen Resource Institute, FORCE Technology (Denmark), and the German IFEU Institute in Heidelberg, according to the ISO standards 14040 and 14044. They were peer reviewed by an independent, international team of three experts led by Gaiker, a Spanish Technology Centre.

LCA compares the environmental impacts (including greenhouse gas emissions) and resource use caused by the different processes included in each of the three tire treatment options. LCA takes into account the substitution of other materials (bitumen, polymer) that would be used in rubber asphalt and as an infill if the tires were not recycled, of the natural aggregates that would be used for drainage layers if tires were not used in civil engineering applications, or of the energy sources that would be used in a cement kiln if tyres were not used as a fuel.

The results clearly demonstrate that applications of used tires substituting virgin rubber and steel are environmentally superior to both the civil engineering and co-incineration pathways[2]. With respect to global warming impacts, the material recycling route reduces potential greenhouse gas emissions by roughly 1.9 t CO_2-eq per ton of scrap tires recycled[3]. Recycling avoids several processes (in particular, production of virgin polymers), which saves about 50 GJ per ton of tires, and the iron fraction eliminates the need for 400 kg of iron ore.

These results are based on information from tire recycling facilities in Germany and Denmark, and were found to be robust and valid for Europe. However, further work would be required to assess the validity of the results for use under the CDM, particularly for global default values.

In conclusion, creating a CDM methodology that could incentivize the increased recycling of consumer goods at end of life to substitute for virgin raw materials or fuels would be a step towards a holistic and more scientific approach to consideration of net mitigation benefits of various product end-of-life treatments. Combusting scrap tires to generate thermal energy in heavy industry (substituting for fossil fuel of higher carbon content) or civil engineering applications both represent net emissions relative to the alternative of tire recycling and substitution for virgin rubber products.

Although Genan's business is restricted to tire recycling, we believe the issues are generic and important from a resource efficiency and climate policy perspective. It is important to ensure that the CDM sends the right signals to the market to adopt the lowest carbon pathways.

We stand ready to share information and expertise to support the work of the UNFCCC on related CDM issues, and would appreciate a communication from the CDM Executive Board at your

---

[2] The LCA for co-incineration assumes that the scrap tires diverted for recycling would be replaced by fossil fuels (coal and lignite) in cement kilns; in the event that the tire component is replaced by waste, the material recycling option provides even further environmental benefit.

[3] The other pathways studied also reduce greenhouse gas emissions, but to a lesser extent: Co-incineration, by 790 kg CO_2-eq per ton of scrap tires combusted; civil engineering, by 20 to 80 kg CO_2-eq per ton of scrap tires shredded and used as fill.

earliest convenience on whether and on what timeframe the Board might plan to expand AMS III.AJ. to make it applicable to other materials, in particular, scrap tires.

Sincerely

Lars Raahauge, Director of Business Development

Genan Business & Development A/S

About Genan

Genan is the world's largest recycler of scrap tires with 4 large recycling plants in operation in Germany and Denmark and one under projection in USA. The technology has been developed since 1990 and the plants are highly sophisticated and fully automated. The tires are recycled into their original components: rubber powder and –granulate, steel and textile. The end products are uniform and clean and therefore very well suited for high quality applications where they are able to substitute virgin materials. Examples are infill material for artificial sports turf, modification of asphalt and bitumen and currently Genan is cooperating with the international tire manufacturer Pirelli on a research project to substitute rubber in new tires with fine rubber powder from recycled tires.