

Implementation of circular economies and industrial waste reuse and prevention solutions

Technical expert meetings on mitigation

1–2 May 2018

World Conference Center

Bonn, Germany

Summary report



United Nations
Framework Convention on
Climate Change



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INDUSTRIAL DEVELOPMENT ORGANIZATION



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Technical expert meetings on mitigation in 2018

Summary report

A number of experts representing the public and private sectors as well as civil society from Africa, Asia, Europe, Latin America and the Pacific met on 1 and 2 May 2018 in Bonn to discuss the implementation of circular economies to achieve emission reductions and generate sustainable development co-benefits. The expert gathering took place as part of the [technical expert meetings on mitigation](#), which aim to identify activities that present high potential for emission reductions in order to boost climate action before 2020.

Led and organized by the [UNFCCC secretariat](#), the [United Nations Industrial Development Organization](#) and the [World Business Council for Sustainable Development](#), the meeting focused on currently available policies and technological solutions as well as innovative waste-to-energy approaches and supply chain redesign solutions. These are regarded as integral elements to achieving a circular economy with key economic, environmental and employment benefits.

The experts shared not only their hands-on experience but also ideas and suggestions for Parties, non-Party stakeholders, such as cities and businesses, and organizations to replicate and upscale innovative approaches.

Notably, the expert meeting was aligned with the format of the year-long [Talanoa Dialogue](#), an important international conversation around ambition now and in the future. The technical expert meeting discussions were structured around the three questions of the Talanoa Dialogue (Where are we? Where do we want to go? How do we get there?) to ensure that expert inputs can easily be fed into the Talanoa Dialogue as well as into other high-level events and the pre-2020 stock take.

All information on the technical expert meetings (including programmes, speakers, presentations, audio-video recordings and background information) can be found at <https://unfccc.int/topics/mitigation/workstreams/technical-expert-meetings>.

Session I: Policy options, technological innovations and best practices on waste-to-energy

In session I of the technical expert meetings on mitigation in 2018, technological innovations, best practices and policy options related to waste-to-energy and the transition towards a circular economy were discussed. The following key issues were raised by panelists and participants:

1. The quality and composition of feedstock, as well as hazardous residue,



are both issues that still pose a challenge, above all from a technical point of view. A potential solution could be to work across sectors and find synergies for feedstock, such as combining agricultural waste with sludge, municipal green and biodegradable waste streams, used oils, and so on;

2. For businesses involved in waste-to-energy, among the biggest challenges are securing economies of scale and offtake agreements and leveraging private finance. The issue of private finance being too focused on safer, shorter-term investments was raised, as was the counterpoint of development banks being too focused on large-scale projects, which poses a problem for any technology or innovation that needs medium-sized financing at a reasonable interest rate ('patient financing') in order to be piloted and brought to the market at relatively low business risk. Biomass and waste anaerobic digestion may, however, be feasible on a small scale as the technologies are less dependent on scale;
3. Policymakers have difficulties creating attractive feed-in tariffs because of lack of funding;
4. Obsolete infrastructure is making it difficult for energy produced from waste to be optimally used or stored;
5. In terms of the impact on employment of moving towards a circular economy, there is the issue of how waste-to-energy technologies in the municipal solid waste sector are affecting the livelihoods of waste pickers.



The key messages derived from the session I are the following:

1. A business case can be made for waste-to-energy, all the more so if developers look for synergies between different waste streams. Such synergies would help to guarantee sustainable, quality feedstock, which all investments require; they would also allow more feed-in flexibility;
2. Before reaching a scale that can facilitate financing and provide more business opportunities, most waste-to-energy technologies must be applied on a small scale to offer solutions to small farmers, communities and waste generators. Once proven effective on that scale, they can then be rolled out and replicated, something best achieved by governments as they can most readily reconcile the interests of those financing and those implementing such projects;

3. Waste-to-energy business models should take into account the welfare of waste pickers and their associations to make sure the livelihoods of the most vulnerable are safeguarded. It was pointed out that such inclusive business models expand the project perspective from a strictly municipal concern to one that spans not only waste picker organizations but also private sector operators;
4. Cooperative investment financing was suggested as a way to make cutting-edge waste-to-energy technologies accessible. Although hydrogen fuel, as the cited example, requires a high initial investment, it then promises low-cost energy because of low operational costs, while guaranteeing high energy security. Investment in such technology through cooperative financing could help to catalyse change;
5. In rolling out and replicating waste-to-energy solutions, the sustainable development co-benefits of such projects should be considered. As an example, the benefits of biochar for soil rejuvenation and carbon sequestration were cited;
6. In certain regions, notably small island developing States, the policy on waste-to-energy practices should ideally be standardized, or at least sufficiently compatible between nations so as not to create barriers to business in the sector.

Session II: Policy options, technological innovations and best practices on circular economy, including elements of supply chain redesign

In session II of the technical expert meetings on mitigation in 2018, the supply chain redesign aspect of the circular economy was the focus. The following key issues were raised by panelists and participants:

1. For leaders and those responsible for shaping policy on the circular economy in general, and on supply chain redesign in particular, balancing the various interests involved remains a considerable challenge. Consumers want a move towards more sustainable practices to happen more quickly and convincingly, while those trying to meet that demand by investing in product redesign are calling for more predictable, more supportive policies. Technologies are evolving fast and policymakers are hard-pressed to provide a legal framework that can keep up with the pace of progress. Long-term investment decisions (covering 40–50 years) are hard to make given the dynamic nature of the market, technology and policy. Lobbying by traditional, polluting industries also complicates the task of balancing interests, particularly when they bring up the spectre of job losses;
2. How can businesses plan for much needed long-term investment in product redesign and decarbonization in the context of such constraints and perpetual change? A solution proposed on numerous occasions was to set up and maintain better platforms for consultation between policymakers, waste producers and waste converters;



3. Circularity is hard to measure and industries are having to take the lead in developing key performance indicators. Efforts are needed to boost standardization so that a common language can evolve for communicating on circularity;

4. Recycling is still downcycling and so value is being lost. This innovation needs more financial support, which is difficult to find;

5. Globalization is a barrier in some ways to the transition towards a circular economy because of the leakage of certain waste streams from developed to developing countries as well as the loss of competitiveness for forerunners in product redesign. Internalizing externalities takes effort and investment, making products from countries that are forerunners more expensive but also reinforcing their positions in certain markets;

6. Differences in policy between countries and regions is another barrier. Those who provide and those who source materials often face difficulties working together because of inconsistent and conflicting policies;

7. The importance of managing the social impact of the transition towards a circular economy, in terms of loss of jobs and livelihoods, was discussed, an issue that was also raised in session I.



The main messages delivered in session II were the following:

1. Policies that connect material efficiency, energy efficiency and skills development are needed to facilitate a smooth transition towards a circular economy as well as to increase confidence in investing in the circular model;

2. Understanding which interventions have the most mitigation impact, based on life cycle assessment analysis of the supply chain, as well as rewarding mitigation actions through policy instruments would help to target and incentivize high-impact mitigation actions;

3. Nature-based solutions, such as green spaces in cities, can serve as good carbon sinks, all the while feeding into policy decisions and helping shape business models. Carbon emissions can be avoided, for example, by using bamboo instead of steel in piping and by turning textile and paper waste into sources of the same. 'Close the loop' projects are being tested in China and Sweden, specifically with plastics; results still to be announced;

4. Policies across the board, not just environmental policies, need to shift from a linear to a circular approach. This includes economic policy, of course, but fiscal policy needs to create the right incentives for a shift towards more circularity. It was pointed out that

"we no longer manage assets, but rather provide circular economy solutions", and that "we cannot keep taxing labour and waste while exempting resource extraction and usage";

5. The evolution of policy in a circular economy requires strong and sustained collaboration, which can be achieved through various instruments, such as digital and other platforms, councils, coalitions, matchmaking, incubators, and formal and informal consultation, in order to support social innovation. Recycling and reuse is familiar to consumers, but other stages of looping such as prevention, material engineering and supply chain redesign should be applied and focused on;
6. Consumer behaviour represents high potential for energy savings and a more circular approach to resource consumption in general. Awareness-raising is needed to incite consumers to choose products that are more aligned with circular principles. Home life was identified as offering huge potential for energy and material efficiency.

Session III: Replicating and upscaling innovations and best practices on waste-to-energy and the circular economy, including elements of supply chain redesign

In session III of the technical expert meetings on mitigation in 2018, the potential for and challenges of replicating and rolling out circular economy policies and technologies were discussed. The following key issues were raised by panelists and participants:

1. Toxic residue is still a barrier to recycling and reuse. Upstream solutions, such as better material engineering, product design and green chemistry, are essential to solving this problem;
2. Increasing consumption means that more waste is still being created in most economies. This is a problem when it comes to toxic residue production, but it was also suggested that the term 'waste' is increasingly a misnomer and that it should come to be regarded as 'cycling resources';
3. Countries and whole regions with poor waste collection systems and little or no feedstock control or potential for economies of scale are still relatively numerous and must be taken into account in terms of the expected progress of waste-to-energy technologies and policies;
4. Value chains are complex and continually evolving. Including the cost of externalities in the cost of source materials is a pipe dream.





The main messages delivered in session III were the following:

1. Technical assistance and financing must be linked to ensure that technology is transferred while also providing capacity-building in lower- and middle-income countries;
2. A new investment paradigm is needed to help entrepreneurs to roll out and replicate useful and efficient technologies. This type of investment should come in the form of medium-sized, soft loans, guarantees or other suitable financial instruments that are more than seed money for pilot projects but less than the multimillion-dollar financing that is currently the only option available from development banks and agencies;
3. Disassembly and reuse should be inherent to all products in a circular economy. These features need to be part of the product design;
4. Digital and ICT technologies should be an integral part of the push towards a circular economy because they offer a lot of potential, not only for collaboration and knowledge-sharing but also for linking different value chains and developing zero waste, infinite loop materials;
5. Short-term returns on investment are not possible when a whole economic model is shifting. Investments must be focused on value rather than on returns on investment;
6. Changing lifestyles and habits among households and consumers is key. Significant progress can still be made in shifting towards a more circular model in consumption patterns. Social innovation is important: "If we don't look at changing lifestyles, all technological and policy innovations will have limited impact". Families can reduce waste by up to 70 per cent and energy use by up to 30 per cent with a combination of raised awareness and access to new technology;
7. Policies must communicate the push towards a circular economy in ways people can both understand and rally to, such as the campaigns "Clean India" and China's "Less Pollution";
8. Sharing knowledge through open sources is essential for technological innovation. Again, digital and ICT technologies were identified as prime facilitators of this;
9. Cities and industrial parks provide ample opportunity for symbiosis, sharing, and cost, material and energy efficiency. And yet the stumbling blocks preventing cities from achieving 100 per cent circularity are not so much technological as they are political and economic.



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