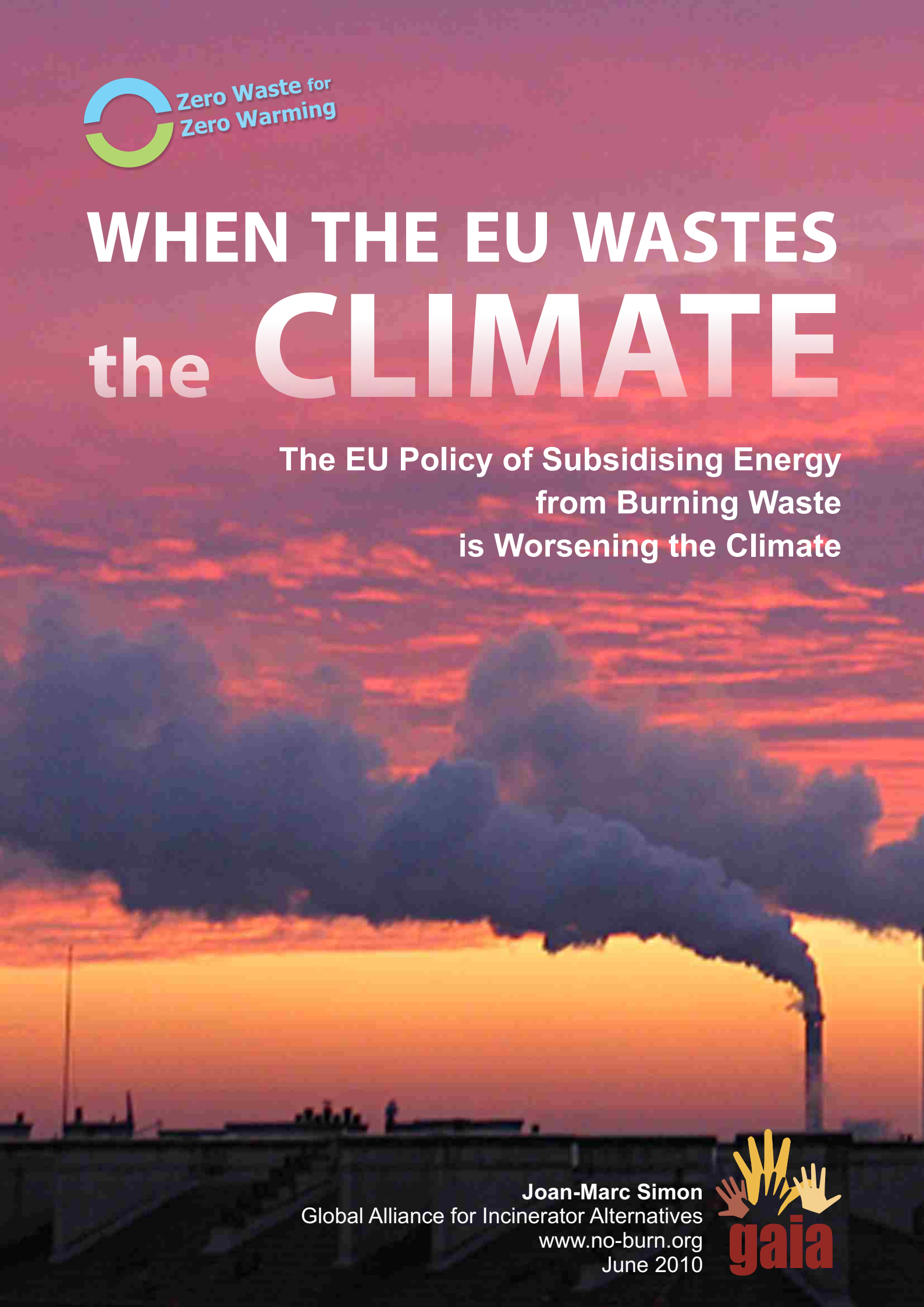
Zero Waste for Zero Warming

WHEN THE EU WASTES the CLIMATE

The EU Policy of Subsidising Energy from Burning Waste is Worsening the Climate



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June 2010

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GAIA is a worldwide alliance of more than 600 grassroots groups, non-governmental organizations, and individuals in over 89 countries whose ultimate vision is a just, toxic-free world without incineration.

Acknowledgments:
In France: CNIID - Centre National d'Information Independante sur les Dechets", www.cniid.org
In Spain: ISTAS - Instituto Sindical de Trabajo Ambiente y Salud, www.istas.ccoo.es
In Italy: Ambiente Futuro, www.ambintefuturo.org

Cover photo by: Centre National D'Information Indépendante sur les Déchets (CNIID), France
http://www.cniid.org/

1. ABSTRACT

This work analyses the contradictions of EU (European Union) policy when promoting and funding a false renewable energy - that is, the energy from burning waste.

A big part of the energy produced by European incinerators is considered to be renewable energy, which allows them to receive considerable rate premiums and subsidies. This has the effect of a false green subsidy to burn waste that could be recycled or composted. In reality these subsidies end up creating the opposite of the intended effect: more greenhouse gas (GHG) emissions in the short term, less sustainability and less incentive to green the economy.

2. Climate Change Worsened By "Green" Energy From Incineration

Leading scientists and bioenergy experts from US and Europe have been announcing that an accounting mistake in Clean Development Mechanism (CDM) will cause the measures intended to fight climate change to effectively increase GHG emissions[1]. "*Proper accounting can enable bioenergy to contribute to greenhouse gas reductions; improper accounting can lead to increases in greenhouse gas emissions both domestically and internationally*".

The root of the problem lies in a mistaken understanding of Intergovernmental Panel on Climate Change (IPCC) guidance. When reporting their GHG emissions, energy companies are not including the CO_2 released from burning biomass (plant matter). What this means is that technically, countries could cut down their forests, turn them into deserts and use the trees to replace coal, and they would still receive credit from the CDM for reducing emissions from coal, even while increasing overall emissions.

Based on this mistaken understanding of the IPCC guidance, the EU has defined its policy on Renewable Energy (2009/28/EC) which includes the energy from burning biogenic waste (paper, cardboard, food waste, some textiles, etc.) as renewable energy. This has triggered a good amount of subsidies to be deployed to burning waste when:

- subsidizing incineration contradicts the spirit of the EU waste law,
- energy from incinerators is neither green nor renewable.

Photo Courtesy of CNIID

Photo by CNIID

3. Subsidising Incineration Contradicts EU Law

The Waste Framework Directive spells out a waste hierarchy in which prevention, reuse and recycling have preference before incineration with energy recovery and disposal. Composting should therefore have priority over burning since biodegradable waste can be composted and energy can be extracted from it via anaerobic digestion.

In reality, the premiums given to energy from incineration play a critical role in making incineration more attractive than environmentally and economically sound options such as recycling and composting.

Hence, European legislation presents a clear contradiction between what it preaches and what it really promotes; the European Commission acknowledges that prevention, reuse and recycling generate less GHG emissions than incineration or landfill, yet 50% of the recyclables in Europe are either burnt or landfilled[2]. Moreover, EU legislation encourages burning a waste stream that could be anaerobically digested and then composted, bringing the carbon back to the soil and hence helping, together with the fully and truly renewable energy coming from anaerobic digestion, fight climate change.

"In Europe the green subsidies for renewable energies end up promoting burning waste instead of recycling. This gives wrong incentives to the markets and contradicts the waste hierarchy."

4. Why is the System Giving Wrong Incentives?

Because recycling and composting do not generate electricity, they are deemed ineligible for renewable energy premiums in the current system whilst burning waste, which generates electricity inefficiently and is a step lower in the waste hierarchy, still manages to get such reward. This system of premiums is flawed. By favouring only the production of energy it effectively penalises saving energy.

Prevention, reuse and recycling save big amounts of energy, materials and emissions - in some cases up to 25 times the energy produced by incineration. For every product that is burnt a complete new process of extraction, process, manufacture and transport has to take place. Yet these energy savings are not accounted for anywhere and the market not only does not take them into account but, with the premiums, also penalises these most environmentally and economically sound options.

The European legislation fails to translate into policy the energy savings that prevention, reuse and recycling bring to the economy. Generating real renewable energy - not energy from incineration - is important but even more important is to reduce the demand of energy and this can be done dramatically if waste is prevented.

"by favouring only the production of energy the system is effectively penalising the savings of energy"

On top of the system of premiums, the current Waste Framework Directive upgrades most incineration plants to the level of "recovery." This push for incineration on the legislation side is complemented on the economic side with billions of EU regional and cohesion funds and loans from the European Investment Bank going to subsidise the building of new incinerators all over Europe.

5. Energy Produced by Incinerators is Neither Renewable nor Green

The European Directive 2009/28/EC[3] on the use of energy from renewable sources classifies burning biomass as a renewable energy. The definition of biomass (Article 2) includes biodegradable waste, which opens the door to allow premiums on the generation of energy from burning biodegradables. Every member state decides on the percentage of biodegradable waste present in the waste and hence eligible to be subsidised as renewable energy. However, in member states such as France or Spain 100% of the electricity produced in incinerators, regardless of the biodegradability of the waste, is eligible for premiums. Italy followed the same scheme but decided to change it in 2007 thanks to the popular pressure and following the EU Directive now it *only* subsidises burning biodegradable waste.

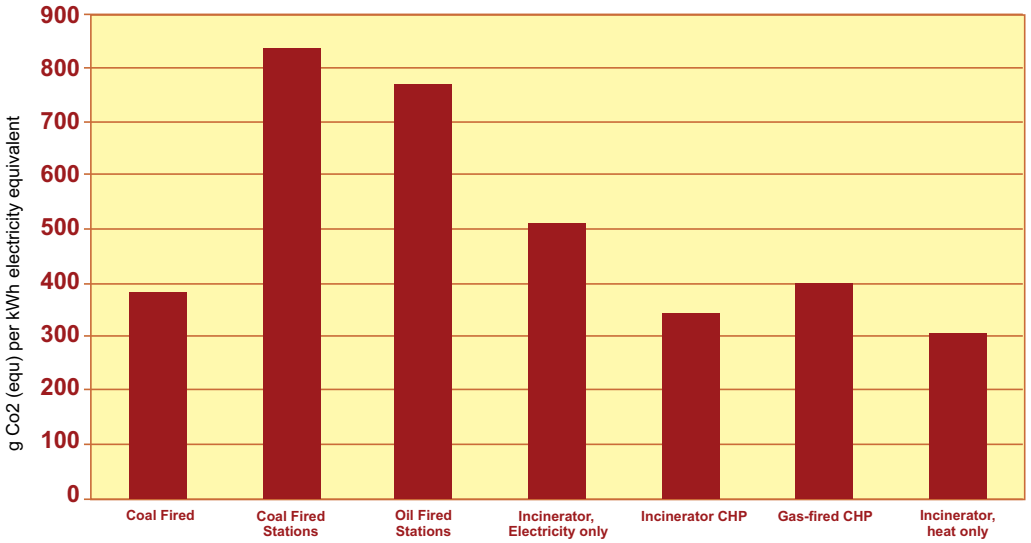
When it comes to climate change, the carbon emissions of the next decades are crucial to avoid the point of no return in warming the planet. It is therefore necessary to reduce carbon emissions in the shortest possible term whilst decarbonising our economies.

However legislation discounts the biogenic carbon - from 30 to 50% of the total carbon emissions depending on different national laws - which considerably reduces the carbon emissions "that count" - this is an accounting rule that does not reduce the total CO_2 emissions.

This is highly misleading because it puts burning biodegradable waste at the same level as composting and anaerobic digestion. However, the reality is that, as acknowledged by the IPCC, composting manages to capture and "sequester" part of carbon in the soils for some years which help to gain time in the fight against climate change[4]. Plus it has lots of positive externalities such as:

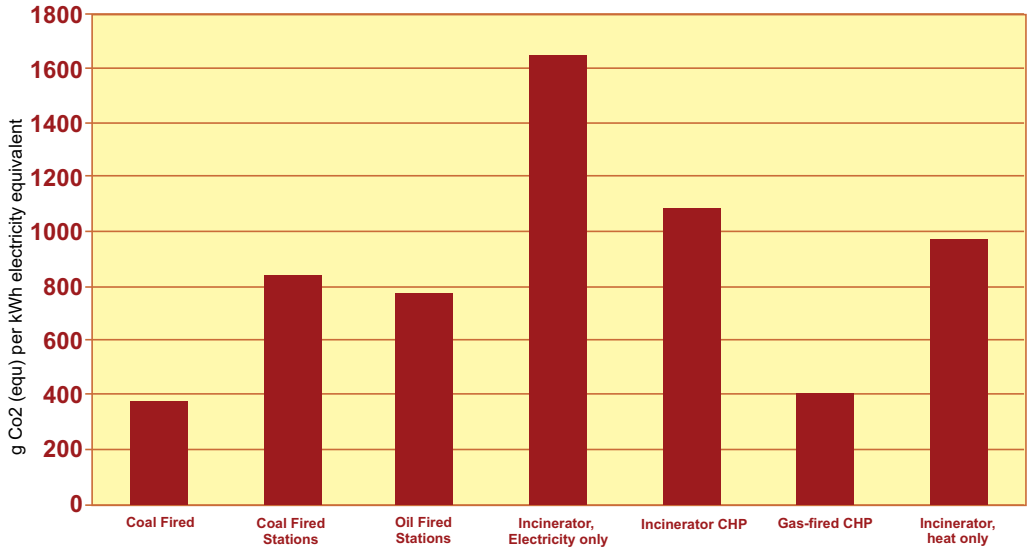
- water and minerals retention which help to avoid desertification and floods,
- creation of local jobs in the collection and treatment of biowaste,
- increase soil productivity (replacing energy intensive fertilisers) and
- help reduce N_2O emissions from mineral fertilisers, which is important since N_2O has a global warming potential of 310 (310 times more powerful than CO_2 to trap heat).

Emissions not counting biogenic carbon



Source: Dominic Hogg, "A Changing Climate for Energy from Waste," Eunomia Consulting, March 6, 2006

Emissions including all carbon



Source: Dominic Hogg, "A Changing Climate for Energy from Waste," Eunomia Consulting, March 6, 2006

Therefore burning biodegradable waste is not only *not* climate neutral but, because of opportunity costs and important neglected externalities, has a negative effect on the fight against climate change.

6. Green Energy?

Burning biogenic carbon is clearly not "green", rather it effectively discourages the sustainable alternative, which is composting. Plus, by subsidising the energy produced with biogenic carbon (less than 50% of total) we incentivise the burning of the other 50% which normally includes recyclables which, according to general consensus, will be better off prevented, reused or recycled.

It is important to understand that the figure representing the biogenic percentage of the waste is not measured, but decided by politics. Studies show that the effective biogenic carbon in the waste is lower than that normally considered eligible as "renewable energy". The UK estimates are that with recycling rates of 60% the biogenic carbon is 35% of the Municipal Solid Waste (MSW). The difference between the percentage considered for the subsidy and the real content of biomass - sometimes up to 20% - equals the amount of fossil fuels whose burning is being subsidised as renewable energy, which is against EU law.

Moreover, since biowaste includes a high amount of water (up to 80% in food waste) it remarkably lowers the energy efficiency of energy recovery through thermal treatment; therefore the energy efficiency with which the incinerators are producing the electricity which qualifies for "green premiums" in many cases doesn't surpass 20% and is typically below 25%. When comparing with wind or solar energy - with energy efficiencies above 80% - but also with all other types of power stations based on fossil fuels (whose efficiencies are typically much higher) one wonders why such an inefficient and damaging technology is being subsidised.

"The renewable energy directive distorts the waste hierarchy. Incineration is given priority in detriment of compost and anaerobic digestion."

Photo courtesy of Greenpeace

Composting facility in Netherlands. Photo by Joan Marc Simon/GAIA

Paradoxically, the article 13.6 of the directive on renewable energy reads, "In the case of biomass, Member States shall promote conversion technologies that achieve a conversion efficiency of at least 85 % for residential and commercial applications and at least 70 % for industrial applications."

But this doesn't apply to burning organic waste. The same directive rules that only green power from non-hybrid installations (e.g. solar-photovoltaic systems, wind turbines and hydroelectric power stations) shall have priority. Electricity from hybrid installations shall not have priority rights, as it is deemed too difficult to determine the proportion of sustainable and non-sustainable electricity that is produced at the same moment in the same installation. However, the exception to this is the electricity from waste incineration plants which qualifies under the priority rules.

The spirit of the Waste Framework Directive is - through the application of the waste hierarchy - to encourage the treatment of biodegradable waste in a responsible manner and get real renewable energy out of it. Unfortunately, EU renewable energy policy does exactly the opposite and effectively subsidises a less environmentally favourable option.

There is a real danger that the efforts of the EU to fight climate change will give results only in the statistics but not in reality.

7. How to Fix the Situation?

Energy from incineration is neither green nor renewable, hence, premiums to the production of energy from waste should be stopped.

Energy savings in waste:

When it comes to energy balances, the biggest potential impact of the waste sector is in energy savings through the prevention

and hence reduction of waste and through reuse. The recycling of waste is more energy intensive than prevention but it is still better for the environment than incineration with energy recovery[5]. This is recognised by the Waste Hierarchy of the Waste Framework Directive and the only thing lacking is implementing it and setting the right drivers and financial incentives. It is therefore crucial to shift premiums and subsidies from incineration to the most favourable options.

Renewable energy from waste:

Renewable energy can be extracted from biodegradable waste through anaerobic digestion and extra benefits can be reaped when bringing the carbon back to the soil. Studies show that composting green waste saves as much CO_2 as incineration[6]. However, when on top of direct CO_2 emissions we include secondary effects, such as the power of compost to sequester carbon or the fact that incineration hinders prevention, reuse and recycling, the effects of composting notably overtake those of incineration as a waste treatment.

When composting is complemented with a prior anaerobical digestion process, the total net savings are considerable. Plus anaerobic digestion and composting don't distort the treatment of the other waste streams; on the contrary, a separate collection of biodegradable waste has the positive externality of allowing for a higher recycling efficiency of the remaining waste.

Premiums and subsidies:

The current system of premiums and subsidies for incineration in Europe clearly favours the less environmentally-sound option and contradicts the goals that the legislation is meant to achieve. It is urgent to shift the economic drivers to get sound waste and resource management in Europe. At the least, a good system of market incentives should definitely favour energy savings as much as it favours generation of energy.

Therefore, if there is no will to remove the current unfair system, the only sensible approach compatible with the current premiums is the definition of an EU methodology to account for the energy savings of prevention, reuse and recycling which should also be eligible for premiums. The fact is that having only premiums for energy generated creates a big market distortion.

The directive on Renewable Energies 2009/28/EC has December 2010 as a deadline for transposition. It is very important that in the next months the member states take the initiative of prioritising the proper application of the Waste Hierarchy ahead of the misleading guidance that is given by the Renewable Energy directive.

8. Case Studies

Analysis of the situation in different European countries:

FLANDERS, BELGIUM

In Flanders, incineration is subsidised as "renewable" energy only for the generation of electricity.

Approximately 48% of the electricity produced in an incinerator is considered to be generated from biogenic sources and thus renewable. The companies receive "green electricity certificates" for this energy. This subsidy is €20 to €25 per ton of waste input. Considering that in Flanders 1.3 million tons of wastes are incinerated per year we can estimate a subsidy of between €26 and €33 million. This means that every Flemish citizen pays around €5 to subsidise incineration and €0 to subsidise composting or recycling.

It is important to note that the definition of biogenic carbon used in Flanders is quite wide and for instance 40% of wool in any wool/nylon sweatshirt is considered to be biogenic carbon and hence taken into account as renewable energy when burnt. The formula used to calculate this is also dubious since non-biogenic energy can be used to dry biogenic waste.

FRANCE

Following the European Directive on renewable energy (2001/77/CE now 2009/28/EC), France has been implementing a reduction of taxes on energy from waste since 2006. In France, incineration is considered a source of renewable energy (50%). But also all the energy produced is considered to be "recovered" energy which allows all the energy to qualify for financial benefits. At the same time, in France there is a compulsory fee to buy the electricity produced by incinerators and a lower VAT tax (5.5% instead of 19%) for those incinerators that recover heat.

For the electricity, nowadays the fees are from 4.5 to 5 cents €/kWh plus a premium for energy efficiency from 0 to 0.3 cents€/kWh[7]. The national company Electricite de France (EDF) is obliged to buy this energy at the established prices. In winter, when the demand is higher, the fees can be increased which causes some incinerators to stock waste in autumn and burn it when the price of energy is higher.

Photo Courtesy of CNIID

Despite the generous subsidies to burn waste - most of which could be recycled - the industry continues to ask for increases in the fees. In times of high energy prices, there have been cases in which generators have been plugged into the grid to sell more electricity and hence get more subsidies.

In contrast, the French incinerators emit the equivalent CO_2 of 2.3 million cars and on top of that emit a big number dangerous pollutants[8].

The national group CNIID (Centre National d'Information Independante sur les Dechets) denounced in 2009 the contradiction with the "polluter pays principle" and the waste hierarchy (2008/98/EC) that incinerators get tax exemptions and premiums whilst

constantly discouraging reuse, recycling and composting[9]. On the contrary, because of its harmful impact on the environment and climate change, incineration should be taxed.

A new law from 2009 introduces a general tax on polluting activities (*taxe générale sur les activités polluantes* - TGAP) which is applied to the waste entering an incinerator. However this tax does not take into account the impact that incineration has on climate change - both the GHGs emitted by incineration and the emissions that could be saved if the waste were recycled, composed or reused instead of being burnt.

ITALY

Between 2001 and 2007, the directive 2001/77 was - intentionally - wrongly implemented and resulted in 7% of the electricity subsidising incineration of biodegradable and nonbiodegradable waste as green energy. This is still being applied for old incinerators whilst new ones fall under 2009/28 directive and only consider energy from biogenic carbon to be renewable.

However, the percentage of renewable energy has been arbitrarily established at 51%, which is remarkably higher than what scientific investigations have demonstrated. The unit subsidy has been defined in such a way to ensure a target price of energy from incinerators at 20 cents€/kWh, i.e. three times higher than the typical market price for energy, which is able to reduce the cost of incineration by some €150/tonne.

The organisation Diritto al Futuro[10] is requesting the company responsible for electricity distribution (Gestore del Servizio Elettrico Nazionale) to pay back to the Italian citizens the €40 billion that since 2001 Italian citizens paid to finance renewable green energy and instead ended up financing burning resources and generating more pollution. That is, every Italian citizen has subsidised incinerators with more than €650 during the last 9 years with money meant to finance renewable energy.

SPAIN

In Spain, the premiums for energy from incineration are regulated according to the Royal Decree 661/2007 and they will be reviewed in 2010.

The system is very complex and the premiums mainly depend on how much gas and/or oil is added to the waste to increase its calorific value (so that they can jump from 20% to 35-40% energy efficiency and hence get more premiums) and on whether the plant sells the energy directly to the market or agrees to sell it for a regulated fixed price (6,449 cents €/kWh). If it sells the energy to the market, there are upper and lower limits for the price to make sure that the plant covers the cost of burning waste.

In Spain, the energy produced by burning municipal solid waste in 2008 was 2732 GWh. The price of electricity in 2009 was between €32.25 and €51.13/MWh but due to the fluctuation of prices and the different composition of waste it is very difficult to know how much money is generated in premiums or by just selling the energy from the Spanish incinerators.

If we assume the price of €6,449/MWh for the production of electricity of 2008, then of 2.732 GWh Spanish citizens subsidised incineration with €177 million per year. That is, every Spanish citizen pays €4 a year to subsidise incineration and €0 to subsidise, for example, compost. Once again, in a country with problems of advanced desertification it is difficult to argue why it is preferable to subsidise the option of burning biowaste before bringing the carbon back to the soil.

9. Conclusion

The current situation regarding premiums to incineration - for the biogenic fraction or the whole MSW is highly dangerous for the European Union because it sets the wrong market incentives and it is highly probable that increases the carbon emissions.

Moreover, the amount of waste incinerated in Europe will increase considerably during the coming years thanks to the favourable reclassification of incineration in the new Waste Framework Directive and the billions of euros given by the European Commission in the form of Regional and Cohesion Funds and the contribution of the European Investment Bank with credits and loans.

Some 100 incinerators might be built in southern and eastern Europe in the coming years (most of them with EU help). Once the current west-European practices of giving premiums to energy from incineration are applied to the new incinerators we could see how, if all Europeans subsidise incineration like the Belgians, the French or the Spanish, €2.5 billion per year would go to subsidise the energy produced by incinerators in Europe. This is half of the cost of building a European-wide smart-grid[11].

If Europe is to follow the Italian pattern (€72/capita/year) up to €36 billion of taxpayers money - not including the billions in structural and cohesion funds already invested in building the furnaces - would go to subsidise the energy that so inefficiently is produced in incinerators. With this money Europe could build the EU smart grid in only 7 years!

Wastepickers at COP 15,UNFCCC in Copenhagen stress climate benefits of waste reduction, recycling, reusing and composting. Photo by Dave Ciplet

Europe lives in times of economic crisis and rising public deficits which forces the EU and the member states to streamline their supporting measures and encourage the really renewable energies. Studies prove that a lot more energy is saved if waste prevented or recycled, yet these energy savings are not only not accounted for but also discriminated in the subsidies and primes scheme.

It is hence urgent to re-channel the flow of public money from subsidies and premiums to incineration to real renewable and green technologies.

Endnotes:

1 Ninety scientists urge the US Congress not to "Cook the books" http://216.250.243.12/90scientistsletter.pdf

2 The study "Gone to Waste" from FoE reveals that 50% of the recyclable material in the EU ends up dumped or burnt (countries like Germany, Holland or Denmark would burn it whilst countries like Poland, Bulgaria or Greece would bury it). According to the study these materials would have a minimum potential monetary value of 5.25€ billion.

3 2009/28/EC http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF

4 Favoino, Enzo and Hogg, Dominic, "The potential role of compost in reducing greenhouse gases." Waste Management Research 2008; 26; 61, http://wmr.sagepub.com/cgi/content/abstract/26/1/61

5 "Environmental benefits of recycling – an international review of life cycle comparisons for key materials in the UK recycling sector." WRAP 2010

6 Kranert, M., Gottschall, R., Bruns, C. & Hafner, G, „Energy or compost from green waste? A CO_2-based assessment." 2010 *Waste Management*. 30: 697-701.

7 http://www.developpement-durable.gouv.fr/energie/renou/se_ren_a4.htm

8 http://www.invs.sante.fr/recherche/index2.asp?txtQuery=dioxines+ordures&Submit.x=0&Submit.y=0

9 http://www.cniid.org/espace_telechargement/actualite/dechets_climat_explications.pdf

10 http://www.dirittoalfuturo.it/vertenza.html

11 http://www.greenpeace.org/international/en/publications/reports/renewables-24-7/