GE/EUCO2 80/50 Press Round Table

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Radisson Blu Royal Hotel
Hammerichsgade 1
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Denmark

EUCO2 8050 project summary

Please also view the EUCO2 80/50 project CD – 2009/2050

Climate change is an urban issue. Climate change needs urban change.

Climate change is global and needs a global response at the international and national levels. But most greenhouse gas emissions come from the world's major urban areas. Reducing emissions means lowering demand for energy and decarbonising its sources of supply in urban areas. We call this "mitigation".

It means effective action by people in their daily lives and by those who control the major energy users, such as industry and transport. Everyone must understand the contribution they can make and the way they can make it.

How are Europe's major urban areas to find out the amount of energy they are using, how to reduce this and how to decarbonise it?

METREX, the Network of European Metropolitan Regions and Areas, has promoted the EUCO2 project, which has been designed to answer these questions. It is being led by the Metropolregion Hamburg.

The EUCO2 project is designed to operate at the "metropolitan" level, that is, the level of a major urban area and its surrounding area of influence.

The metropolitan level is the level at which the big strategic decisions about the future of an urban area need to be taken. In many case it is the only level at which informed, effective and "joined up" policy can be made and implemented.

For example, where the reuse of land and buildings can be balanced with the demand for development and where this can be integrated with the provision of transportation and supporting infrastructure.

It is also the level at which, crucially, demand for and supply of energy can be seen as a whole and rebalanced for a low carbon future.

We need to think global, plan metropolitan and act local.

There are many interests with a part to play in such rebalancing, including, social, economic and environmental and energy providing bodies in the public and private sectors.

These are the "stakeholders" who must be involved in the process from the beginning.

Climate change specialists
Strategic planners
Energy suppliers
Economic interests
Social and welfare interests
Transportation interests
Infrastructure services
Environmental interests and
Developer interests

However, someone must orchestrate the metropolitan mitigation process.

In some cases a level of metropolitan governance may exist to take a lead. In other cases it will have to be set up. Established regional, provincial, city or community governance structures will have to cooperate and set up a metropolitan level of decision-making and implementation.

The EUCO2 approach has four steps.

1 Production of a metropolitan Greenhouse Gas Inventories.

These tell metropolitan governance and stakeholders how energy is supplied and used in their area and what the consequential greenhouse gas emissions are.

This is the basic knowledge needed from which to, collectively, consider mitigation in an informed way.

2 Exploration of alternative routes to effective metropolitan mitigation.

In effect, to explore "what if" questions such as what if buildings were made more energy efficient, more people travelled by public transport or greater use was made of solar power?

3 Adoption of a preferred, and effective, metropolitan mitigation strategy and commitment to the action required to implement it.

Such action will include a programme of specific mitigation measures that stakeholders are convinced will be effective.

4 Establishment of an ongoing process of monitoring the strategy and its implementation, responding to changing circumstances and uncertainties and taking action to sustain mitigation progress.

This is not a theoretical approach. It has been piloted and tested through the EUCO2 project in 18 major European metropolitan areas representing the varied climatic conditions across Europe, north, east, south and west. It works.

It is being taken up in major metropolitan areas in the United States and China, where METREX has working relationships.

The 200 major metropolitan areas of Europe and United States, with a combined population of perhaps 500 million plus, may be responsible for 20% of global greenhouse gas emissions.

This is the scale of the target market for the EUCO2 project. It is ambitious but necessary.
It uses, at its heart, the Greenhouse Gas Inventory Protocol, or GRIP, devised by Dr. Sebastian Carney of Manchester University. The GRIP model and process is described in more detail later.

The full documentation on the EUCO2 pilot project and GRIP can be found through the www.euco2.eu, www.euco.org and www.grip.org.uk web sites.

Why should European metropolitan areas be concerned about climate change and energy security?

Why should they adopt the EUCO2 approach, use GRIP and adopt mitigation strategies?

Climate change represents a significant risk to metropolitan futures. It is a risk that will become progressively more significant, costly and difficult to adapt to, if mitigation is not successful.

Success has been thought of as keeping the concentration of greenhouse gases in the atmosphere at under 450 parts per million, the level associated with a 2 degree Celsius rise in average global temperatures. Even this "success" would have significant adverse effects on may parts of the globe in terms of its ecological carrying capacity and its ability to support a variety of life on earth.

However, it may well be that global temperature rises higher than this are now unavoidable. The International Panel on Climate Change, the IPCC, has looked at these probabilities and regards them with real concern.

The science can now tell us, with some confidence, what the relationship is between the increase in greenhouse gases in the atmosphere and the rise in average global temperatures.

We are now at 430 parts per million and a rise of over one degree Celsius is inevitable. Up to 500 ppm a rise of up to 3 degrees becomes likely but climate change stability is still possible. Beyond this lies a high risk of uncontainable climate change.

At current rates of greenhouse emissions of 2-3 ppm a year we have only until 2050 to achieve stability and the next 10 years are crucial to initiate, commit and establish momentum for the mitigation action that is required.

The International Panel on Climate Change has warned what the risks could be and their potential consequences. Once ice sheet melting and rainforest collapse begins then it would destablise global ecosystems. The potential consequences would include seal level rise in metres, global flooding, ocean circulation disruption, ecosystems switching from carbon absorbtion to emission, species extinction, water scarcity, food yield decline and human health risks.

Many global cities are on coasts, rivers and estuaries for historic geographical reasons. They face expensive adaptation measures, the impact of global migrations and the disruption of global trade.

There is perhaps a misconception that climate change and its consequence is something that is going to happen slowly over the coming century. In reality the science will either confirm that we are stablising climate change or not and this could happen quite quickly.

If we have then there will still be major adaptations to be made. If we have not then confidence in the future of many parts of the world may quickly be lost. And we know from the credit crunch that confidence in value, once lost, can precipitate collapse rather than slow decline.

The global tipping point in the economic futures of many major urban areas may be nearer than we think. This is why greenhouse gas mitigation has to be addressed by all major urban areas with the greatest urgency.

It is why we are carrying out the EUCO2 project.

Metropolitan areas are, for the most part, integrated into the global economy and cannot isolate themselves from its longer-term prospects. Once the inevitable adverse consequences of climate change on global metropolitan areas become known and appreciated then their economic prospects will be affected. Global investment flows will respond accordingly. There could be an investment crunch well before a climate crunch.

Sustainability, in the context of climate change, means the highest possible level of low carbon energy security. Carbon fuel costs will rise with scarcity and environmental penalties. Low carbon locations will be low cost and competitive locations.

Metropolitan areas need to help avoid the environmental risks associated with global climate change, secure their low carbon energy futures and, in consequence, their competitive positions in the global economy.

The energy available to us, day to day, from the action of the sun and the moon on earth, is more than enough for our needs. Renewable energy, from radiant heat, wind, tides and rainfall, is plentiful. Geothermal heat is also a contributory non-carbon source.

The issue is how to capture, store and distribute this.

Decision makers at the metropolitan level may well respond to seek some guidance on the specific mitigation measures that are available now, or are in prospect, even if they do adopt the EUCO2 approach and use GRIP. It is clear that the mitigation of greenhouse gases from urban areas will only be achieved by the collective actions of all those stakeholders with a role to play. All have to make an effective contribution.

This is a checklist of 25 mitigation measures that could be taken at the European, National and metropolitan levels to achieve an 80% reduction in greenhouse gas emissions.

European level

1 EU renewable energy grid
2 Low carbon energy supplies
3 Carbon capture and storage for coal, gas and industry
4 Electric cars and related charging infrastructure
5 Hydrogen and fuel cell trucks and buses and related infrastructure
6 High speed train network for short journeys
7 Few short haul flights with hybrid and bio-fuel power
8 Long and medium haul flights with hybrid and bio-fuel power
9 Maritime hydrogen and fuel cell power
10 Energy efficient appliances
11 Energy efficiency building management systems

National level

12 Road pricing for greenhouse gas, air pollution and congestion control, increased public transport capacity and environmental improvement
13 Building regulations for high insulation

Metropolitan level

14 Local renewable energy supplies
15 Combined heat and power locally and domestically
16 Electric car charging infrastructure
17 Hydrogen and fuel cell truck and bus infrastructure
18 Electric/fuel cell public transport
19 Integrated transportation for local, regional, national and European travel
20 Integrated spatial planning and transportation.
Mixed use, higher density, transport related development
21 New building and retro fitted building insulation programmes
22 Carbon capture and storage for cement, iron and steel industries.
23 Waste management and recycling
24 Local food economies and low carbon agricultural practice
25 Afforestation, water management and micro-climate management

GRIP Summary – Greenhouse Gas Regional Inventory Protocol

GRIP is a computer model that uses data on greenhouse gas emissions that is supplied annually by nation states to the IPCC to enable it to monitor global emissions. This data can be downloaded from the Internet. The model can also use downloadable emission data from Eurostat and specific data from regional or local levels. For example, from specific industrial plants.

National data can be calibrated to the metropolitan level but is less accurate than locally derived data. However, all these levels of data give results that are within high levels of confidence for metropolitan policy making.

GRIP uses data for the four main IPCC sectors of Energy, Industrial Processes, Waste and Agriculture. There are different levels of greenhouse gases associated with each of these.

The basket of six Greenhouse Gases includes,

CO_2 (Carbon Dioxide)
CH_4 (Methane)
N_2O (Nitrous Oxide)
HFC (Hydroflurocarbons)
PFCs (Perflurocarbons) and
Sulpher Hexaflouride SF_6.

They vary in terms of their contribution to the greenhouse effect. For example,

Methane is 21 times more potent than CO_2
Nitrous Oxide is 310 times more potent
HFCs and PFCs vary between several hundred to more than 10,000 times more potent
Sulphur Hexaflouride is 23,900 times more potent

The GRIP model takes account of these major variations in the atmospheric impact of greenhouse gas emissions from energy supplies and their uses and from wastes.

Emissions are usually estimated by applying an emissions factor to a unit of activity. For example, natural gas combustion in the home. The emissions factor used may be specific to the country, which is most accurate, or may be a general emissions factor.

How you allocate the activity and therefore the emissions to an area can be a contentious issue. There are two main approaches to this, producer and consumer. A producer approach is one where the emissions are allocated to where they are released, regardless of where the resultant product may be consumed.

For example, if electricity is produced from combusting coal then the emissions associated with this activity are given to the area where the coal power plant is located. In a consumer approach the emissions associated with the production of this electricity would be allocated to the consumer of the electricity.

It is important to an area attempting to tackle emissions estimation and mitigation to identify the data that it does or does not have. This data relates to the activity that causes the emissions, for example, the amount of natural gas combusted, the amount of waste land filled or the amount of petrol consumed by vehicles in the area.

When local data is available then an accurate emissions estimate can be made and this is called a "bottom up" approach. If the activity data is not available then an estimate can be made using national and regional statistics. This estimation approach is referred to as "top-down".

GRIP greenhouse gas inventories show the bottom up or top down source of the data for each emission source. This enables stakeholders to appreciate where data sources can be improved in future inventories.

GRIP inventories enable comparisons to be made between European metropolitan areas with similar or varied socio-economic or climatic conditions. Such comparisons can aid understanding of the causes and characteristics of emissions and the scope for mitigation.

For example, Swedish energy supplies are largely from low carbon sources, such as biomass, and Swedish metropolitan areas are highly efficient in their use of energy. They have already reached the emission levels sought by other European metropolitan areas.

Compact urban areas, with lower transportation energy use, show lower emissions than sprawling urban areas.

There are four ways in which emissions can be reduced.

1 Change the amount of energy consumed, for example, by reducing demand through improved insulation.

2 Change the type of energy consumed, for example, by switching from coal to lower carbon intensive fuels such as biomass.

3 Change the way energy is produced, for example, by switching from gas based electricity generation to wind based.

4 A combination of these.

A GRIP emissions inventory tells us where we are, or were, and international and national policy and scientific information tells us of where we need to be. The problem is finding out how to get there. Metropolitan governance and stakeholders all have different agendas and different goals. Such goals may have short, medium or long-term horizons. Goals may be in competition with one another, for example, for the exploitation or conservation of natural resources or sensitive areas.

The exploration of alternative mitigation "scenarios", or routes to reductions, can help stakeholders to understand how these might be delivered though collective action and the individual contributions that needs to be made by each stakeholder.

The GRIP model can also be used as a scenario tool. It uses the energy component of the inventories and combines this with "demand side" variables, such as measures to reduce the amount of energy used, and "supply side" variables, such as changes in the type of energy used or the way it is produced.

Such variables are also set in the "context" of anticipated metropolitan futures, including consideration of variables such as demographic and household change, migration, local gross domestic product (GDP) and expenditure patterns.

The GRIP scenario tool allows stakeholders, collectively, to explore a range of such demand and supply measures to achieve the level of emissions reduction required.

This level will vary from metropolitan area to metropolitan area, depending on the wider energy context within which it exists. For example, in a country with a high or low national level of renewable energy.

This process has already been completed by the 18 partner European metropolitan areas in the EUCO2 80/50 project. Their Inventories show that, generally, residential areas are the main source of greenhouse gas emissions, closely followed by transportation. Emissions from industry are directly dependent on the processes involved. The emissions from the energy sector are directly related to the fuels used and their carbon intensity and the technologies used. Emissions from waste depended on the balance of landfill, combustion and recycling. Emissions from agriculture relate to the number of animals and the treatment of their wastes together with the use of fertilisers.

Such findings enabled each metropolitan area to target the sources of their greenhouse gas emissions and the stakeholders involved to have a clear understanding of the scale and significance of their contributions to the overall mitigation strategy.

Knowing the scale and sources of their greenhouse gas emissions, metropolitan policy makers can then move on to explore mitigation scenarios on an informed basis. The GRIP approach is to give metropolitan bodies and their stakeholders the capability to develop the mitigation strategies that are appropriate to their own particular circumstances.

The Metropolitan Region of Hamburg is the Lead Partner of project EUCO2 80/50

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RR/11/12/2009/METREX/Glasgow

Potential EUCO2 80/50 partners

	Metropolitan area	METREX	EUCO2 80/50	Covenant of Mayors
	1-21 not in METREX or EUCO22 80/50			
1	Amsterdam	1		
2	Antwerp			1
3	Athens	2	1	
4	Barcelona	3		
5	Berlin	4		
6	Bilbao (Pais-Vasco)	5		
7	Bologna (Emilia-Romagna)	6	2	
8	Bonn			2
9	Bordeaux			3
10	Bremen			4
11	Bruxelles	7	3	
12	Bucharest	8		
13	Budapest	9		
14	Central Germany	10		
15	Copenhagen/Øresund	11		
16	Cordoba			5
17	Den Haag/Rotterdam	12	4	
18	Dijon			6
19	Dublin			7
20	Eurociudad Vasca	13		
21	Frankfurt	14	5	
22	Genova	15		
23	Glasgow	16	6	
24	Göteborg			8
25	Granada	17		
26	Hamburg	19	7	
27	Hannover	20		
28	Helsinki	21	8	
29	Köln			9
30	Krakow	22		
31	Liege			10
32	Lille			11
33	Lisboa	23		
34	Ljubljana		9	
35	London	24		
36	Lviv			12
37	Madrid	25	10	
38	Malmo			13
39	Marseille	26		
40	Milano (Lombardia)	27		
41	Moscow	28		
42	München	29		
43	Nantes			14
44	Napoli	30	11	
45	Nürnberg	31		
46	Oradea	32		
47	Oslo		12	
48	Paris (Ile-de-France)	33	13	
49	Porto	34	14	
50	Prague	35		
51	Rhein-Neckar	36		
52	Riga	37		
53	Roma	38		
54	Sarajevo			15
55	Sevilla	39		
56	Sofia	40		
57	South Coast Metropole	41		
58	Stockholm	42	15	
59	Stuttgart	43	16	
60	Szczecin	44		
61	Tallinn			16
62	Thessaloniki	45		
63	Torino	46	17	
64	Utrecht			17
65	Valencia			18
66	Veneto	47	18	
67	Vienna	48		
68	Vilnius	49		
69	Vitoria-Gastiez			19
70	Warzawa			20
71	Wroclaw	50		
72	Zagreb			21
73	Zaragoza	51		
74	Zurich	52		