

MEGAPOLI/CityZen - 1st phone conference

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Participants:

Alexander Baklanov, Mark Lawrence, Spyros Pandis, and Alexander Mahura for MEGAPOLI;

Maria Kanakidou, Øystein Hov, and Michael Gauss (rapporteur) for CityZen.

Main goals:

Start the contact; present each other's projects; identify areas of collaboration.

Contents of this document:

I)	Summary	2
1)	Identification of collaboration - differences and overlaps	2
2)	Collaboration on IGAC assessment	3
3)	Establish links to each other's web sites	3
4)	Emission inventories.....	3
5)	Coordinated model studies	4
6)	Exchange of measurement data.....	4
7)	Common data base at NILU.....	4
8)	Exchange and use of each other's mailing lists	4
9)	Future conferences, where MEGAPOLI and CityZen should meet.....	5
II)	Action items.....	6
	Appendix – Research questions of MEGAPOLI and CityZen.....	7
	MEGAPOLI	7
	CityZen.....	7

I) Summary

1) Identification of collaboration - differences and overlaps

Three levels of collaboration have been distinguished:

- 1) (low cost) Exchange of information. Coordinators, but also partners, should come together, e.g. at EGU meetings in 2009 and 2010, where we can try to add one day for a common meeting. Phone conferences among the coordinators should occur every 3 to 6 months. We should have a common view on availability and applicability of input data and results regarding past, present and future.
- 2) (high-cost) Exchange and use of input data, e.g. emission inventories, coordinated model studies (ensemble modeling?), measurements. Not straight-forward, but potentially very high benefit. Start thinking of it now. Common studies should be planned at mid-term (e.g. EGU 2010) at the latest.
- 3) Synthesis in the last year of the two projects. Final event (at EU?) and papers, conclusion documents (joint book/special issue from both projects?), follow-ups of projects beyond 2011. This should be discussed at the EGU meetings in 2009 and 2010.

MEGAPOLI and CityZen have two overlap regions: The Po Valley and the BeNeLux/Ruhr area. This opens for intense collaboration in these areas. It was suggested to define one main responsible project for each of the two regions, e.g. MEGAPOLI for Ruhr area and CityZen for Po Valley.

In addition, areas where collaboration is less beneficial should be identified.

Main differences between the projects:

- MEGAPOLI has a stronger focus on the urban scale.
- CityZen has a stronger remote sensing component, with UBremen, CNRS, and ULeicester.
- MEGAPOLI includes health impacts, while CityZen does not.
- One key task of MEGAPOLI is the measurement campaign in Paris.
- CityZen collects measurements in the Po Valley, the Eastern Mediterranean, and China.

CityZen could profit from the emission regridding expertise in MEGAPOLI. MEGAPOLI could make use of CityZen's satellite data and ground measurements (e.g. Po Valley). This has to be discussed together with the responsible partners.

MEGAPOLI has WGs for each megacity in focus (including Po Valley and Ruhr area), collaboration is suggested with CityZen partners working on Po Valley and Ruhr area.

2) Collaboration on IGAC assessment

In the IGAC “Assessment on Impacts of Mega-cities on Air Quality and Climate - Outline and Activities”, chapter 7 “Europe” is coordinated by Mark Lawrence and Michael Gauss.

Contributing Authors: Maria Kanakidou and others. **More contributions from the MEGAPOLI and CityZen projects will be invited.**

The MEGAPOLI and CityZen Descriptions of Work are a good starting point and relevant information is also given in the section on megacities authored by Mark Lawrence with input already from several of the key members of CityZen and MEGAPOLI, which will appear in Paul Monks’s chapter on “Atmospheric Composition Change: Air Quality and Health – A Review” in the upcoming ACCENT report; information on the Eastern Mediterranean should be included in this in addition.

A first draft has to be ready before the EGU meeting.

3) Establish links to each other’s web sites

MEGAPOLI will link to CityZen, CityZen will link to MEGAPOLI. The temporary web sites are:

<https://wiki.met.no/cityzen/start>

and

<http://megapoli.dmi.dk/>

Common web page for MEGAPOLI and CityZen, with writing access for both projects, will be discussed further and established if needed.

4) Emission inventories

The emission partners of MEGAPOLI and CityZen should, in some way, collaborate. We have to get this process started during the next months.

Mitigation (part of the EU call!), including considerations of planning of megacities (infrastructure, land use, etc.) would be a good field for collaboration.

Future emission scenarios: CITYZEN is getting the projections per country and MEGAPOLI can regrid them in 1x1 or higher resolution. Need to involve emission partners and collaborators: IIASA, Uni Stuttgart, TNO, JRC, AreaNet, etc.

Present day emissions: CityZen will discuss this in detail on a meeting in Paris on Jan 21/22. Each project should keep the ownership and make first use of the data as for the measurements (see below). At a later stage we should consider data protocols and co-authored publications.

Michael Gauss will discuss with CNRS/IIASA possible collaboration with MEGAPOLI (TNO, UStutt) regarding emissions and inform MEGAPOLI coordinators.

5) Coordinated model studies

As far as CityZen is concerned, model runs will be discussed on a CityZen meeting in Paris on Jan 21/22. To coordinate possible model studies it is reasonable to discuss/agree on common data formats and model areas for simulations in advance.

Right now it is too early to plan common model simulations, but at EGU 2009 and 2010 we can discuss this in more detail.

6) Exchange of measurement data

The project that is collecting the data has to be the 'first user' of them. For any exchange a protocol of collaboration should be signed.

7) Common data base at NILU

NILU is involved in both projects. But before using other project's data, protocols should be signed (co-authorship, etc.). The coordinators of MEGAPOLI and CityZen will, in collaboration with NILU, find out if such a common data base is beneficial and how it can be implemented.

On the CityZen meeting in Paris Jan 21/22 the data base issue will be discussed for CityZen.

8) Exchange and use of each other's mailing lists

To distribute job advertisements, calls for papers, announcements of relevant events, etc.

It is agreed that this is possible after the coordinator has been asked for permission each time the other project's list is used (Alexander Baklanov for MEGAPOLI, Michael Gauss for CityZen).

It is, however, understood that we are all flooded with e-mails nowadays, and mailing lists should be used with care.

9) Future conferences, where MEGAPOLI and CityZen should meet

- Air Quality conference in Istanbul, 24-27 March, 2009
<http://www.airqualityconference.org/>

- EGU 2009, Vienna, 19-24 April, 2009
<http://meetings.copernicus.org/egu2009/>

At the EGU assembly 2009 we should organize one small meeting (same participants as in this phone conference), and one big meeting to which we invite all MEGAPOLI and CityZen researchers present at the assembly. Both meetings should be organized within the week of the assembly, e.g. the small meeting on Monday and the big one in the middle of the week, when probably most people are present.

- EMS conference in Toulouse, 28 September - 02 October 2009
http://www.emetsoc.org/annual_meetings/annual_meetings_2009.php

- EGU 2010, April 2010

At EGU 2010, we will organize a common MEGAPOLI/CityZen session (this is a deliverable!). In addition to presenting results, common studies to be done in the last year of the projects should be planned.

- IGAC Conference, joint with CACGP, 11-16 July 2010, Halifax

Consider organizing a megacity session there! This could be an opportunity to continue planning common model exercises.

Splinter meetings of MEGAPOLI and CityZen scientists should be scheduled at least for every EGU assembly (2009, 2010, and 2011).

II) Action items

All:

- Let Michael Gauss know in case you disagree with the minutes or would like to add something
- Start thinking about common data formats (Michael Gauss will inform MEGAPOLI coordinators about CityZen formats after the Paris meeting end of January)
- Keep an eye on ABC programme (<http://www.rrcap.unep.org/abc/index.cfm> - contacts: Mark Lawrence (MEGAPOLI) and Sandro Fuzzi (CityZen))

All coordinators:

- Identify common research questions, where we can work more closely together. Take, e.g., a look at the research questions of MEGAPOLI and CityZen (see appendix) and the DoW's, discuss with partners.
- Consider to publish joint EU leaflet.

Mark Lawrence:

- Send outline of IGAC assessment on megacities to participants of phone conference (DONE)

Michael Gauss:

- Ask IIASA if a splinter meeting at IIASA during EGU meeting would be possible in principle. However, we will wait until EGU schedule is out, before we fix date and venues of EGU splinter meetings.
- In Paris Jan 21/22 discuss with CNRS/IIASA possible collaboration with MEGAPOLI (TNO, UStutt) regarding emissions and inform MEGAPOLI coordinators.

Maria Kanakidou:

- Send instructions about EU web domain to Michael Gauss (DONE)

Appendix – Research questions of MEGAPOLI and CityZen

MEGAPOLI

Main research questions:

- Q1:** What is the change of exposure of the overall population to the major air pollutants as people move into megacities? What are the health impacts of this exposure?
- Q2:** How do megacities affect air quality on regional and global scales? What is the range of influence for major air pollutants (ozone, particulate matter, etc.)?
- Q3:** What are the major physical and chemical transformations of air pollutants as they are moving away from megacities? What happens to the organic particulate matter, volatile organic compounds, etc?
- Q4:** How accurate are the current emission inventories for megacities in Europe and around the world? What are the major gaps?
- Q5:** How large is the current impact of megacities on regional and global climate?
- Q6:** How will the growth of megacities affect future climate at global and regional scales?
- Q7:** What is the impact of large-scale dynamic processes on air pollution from megacities?
- Q8:** What are the key feedbacks between air quality, local climate and global climate change relevant to megacities? For example, how will climate change affect air quality in megacities?
- Q9:** How should megacities (emissions, processing inside megacities, meteorology) be parameterised in regional and global models?
- Q10:** What type of modelling tools should be used for the simulation of multi-scale megacity air quality - climate interactions?
- Q11:** Which policy options are available to influence the emissions of air pollutants and greenhouse gases in megacities and how can these options be assessed?

CityZen

The main objectives:

- Quantify and understand current air pollution distribution and development in and around selected megacities/hot spot regions, including the interaction across the different spatial scales
- Estimate the future impact from emission changes with a focus on the effect of rapid growth in the population of megacities/hot spots and the increasing background of pollutants (concentrate on ozone O₃, particulate matter PM, and their precursors)
- Estimate how megacities/hot spots influence climate change
- Estimate how megacities are responding to climate forcing which can influence transport patterns, chemical oxidation and biogenic emissions (especially biogenic volatile organic compounds BVOC)
- Study mitigation options, e.g. by introducing biofuel, to keep the air pollution load in and around megacities/hot spots within sustainable limits in terms of human health effects and climate impact.
- Develop tools to estimate interactions between different spatial scales (megacities to global)

- Bring the scientific results and methods developed and applied during the course of the project to semi-operational use with those consortium partners that on a more permanent basis provide technical underpinning of policy work, that is, ensure an excellent return on the investment in the project both during and after the project has ended.

Hypotheses to be tested:

- Megacities and hot spots have changed the regional and global distribution of ozone, particulate matter, and their precursors including carbon monoxide CO and other pollutants significantly compared to what would be the case with more evenly distributed emissions.
- Megacities affect the radiative budget and aerosol microphysics such that precipitation and the number of sunlit hours and thus temperature and photochemistry change significantly both locally and over larger regions. This may become more significant in the future as megacities and their emissions grow.
- Climate change will change weather patterns (winds, temperature, stability, precipitation) and surface properties, which affect air quality in megacities and regional hot spots. If more frequent high pressure situations occur, episodes with reduced air quality will become more frequent.
- Climate change will induce episodic and permanent changes in the natural and anthropogenic cycles of atmospheric trace chemicals.
- Changes in frequency and intensity of forest fires and other biomass burning will at times contribute significantly to air pollution in megacities and hot spots.
- Measures can be defined that reduce the adverse effects of megacity/hot spot emissions. The adverse effects relate both to air quality (human health) and climate change/weather modification.
- The effect on air quality in some megacities following the replacement of gasoline in parts by biofuel is to reduce the formation of secondary pollutants: aerosols and ozone.