



Horizon 2020 ClairCity

**Citizen Led Air pollution
Reduction in Cities**

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Techne Consulting

Environment and Energy Knowledge



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Krakow, Poland, 10 May 2017

Abstract

- ◆ ***ClairCity addresses H2020 topic "Improving the Air Quality and Reducing the Carbon Footprint of European Cities" (period 2016-2020)***
- ◆ ***In the presentation ClairCity is introduced giving you an overview of the project and highlighting the topics of greater interest to the community of emission inventories:***
 - ◆ ***Integrating air pollutant emissions & carbon footprint evaluation***
 - ◆ ***Allocate emissions by citizens' behavior***
- ◆ ***The opportunity to become an associate with the project will be finally introduced***





Why ClairCity ?

- ◆ *Two decades of established emissions inventories and evolving modelling practices across the EU have only taken air quality management and carbon reduction strategies so far*
- ◆ *It can be argued that this is because the policy and methodologies used have, for a number of reasons, led us towards attempts to reduce emissions predominantly through technical measures, and away from changing the way our societies and cities operate and function*





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ClairCity overall objective

- ◆ *ClairCity is aimed at creating a major shift in public understanding towards the causes of poor air quality, inviting citizens to give their opinions on air pollution and carbon reduction to shape the cities of the future*
- ◆ *ClairCity will integrate and quantify citizens' behaviour and activities to enrich city, national and EU level policy-making, resulting in improved air quality, reduced carbon emissions, improved public health outcomes and greater citizen awareness*





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ClairCity objectives

The overall objective will be achieved by through the following sub-objectives regarding behaviour and policy, technical tool development, and dissemination and impact:

- ◆ *Putting citizens behaviour and practices at the heart of the debate on air quality and carbon management*
- ◆ *Develop a suite of innovative toolkits for enhanced quantification, engagement and impact evaluation.*
- ◆ *Integrate citizens behaviour in city policies and ensure that future city policies are reflective of citizen's visions for their future city*
- ◆ *Raise awareness of environment changes and their solutions*





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ClairCity main activities

- Through an innovative engagement and quantification toolkit, Clair-City will stimulate the public engagement necessary to allow citizens to define a range of future city scenarios for reducing their emissions to be used for supporting and informing the development of bespoke city policy packages out to 2050
- ClairCity will apportion air pollution emissions and concentrations, carbon footprints and health outcomes by city citizens' behaviour and day-to-day activities in order to make these challenges relevant to how people chose to live, behave and interact within their city environment
- ClairCity will use six pilot cities/regions





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ClairCity Consortium



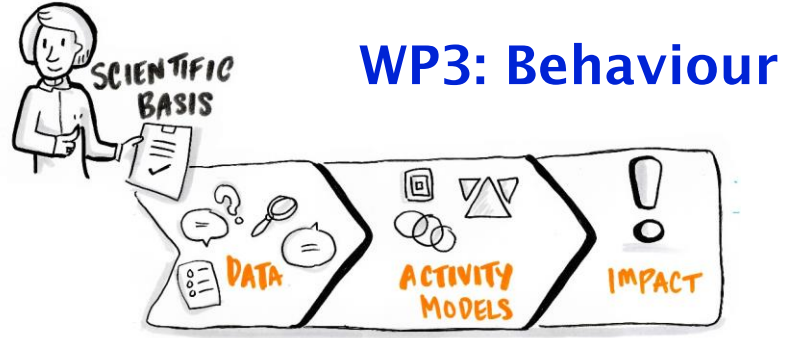
1. **Trinomics B.V. (Project Coordinator – Netherlands)**
2. **University of the West of England, Bristol (Technical Lead – UK)**
3. **PBL Netherlands Environmental Assessment Agency (NL)**
4. **Statistics Netherlands CBS (Netherlands)**
5. **Technical University of Denmark (Denmark)**
6. **Norwegian Institute for Air Research (Norway)**
7. **REC Regional Environmental Centre (Hungary)**
8. **TECHNE Consulting (Italy)**
9. **Transport & Mobility Leuven (Belgium)**
10. **University of Aveiro (Portugal)**
11. **Municipality of Amsterdam (Netherlands)**
12. **Bristol City Council (UK)**
13. **Intermunicipal Community of Aveiro Region (Portugal)**
14. **Liguria Region (Italy)**
15. **Municipality of Ljubljana (Slovenia)**
16. **Sosnowiec City Council (Poland)**



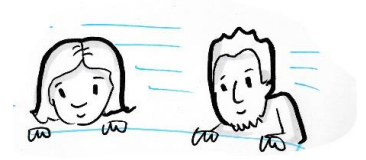


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ClairCity workpackages



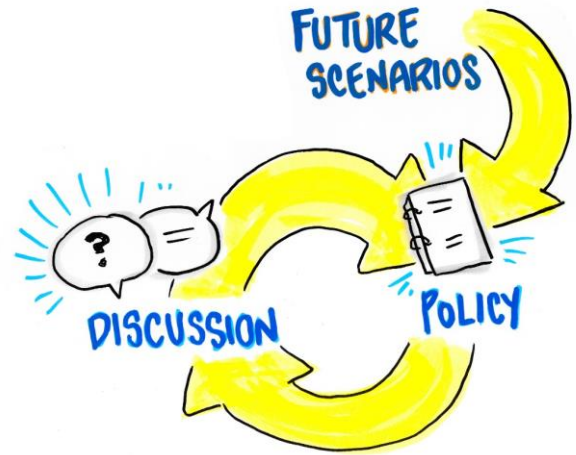
WP3: Behaviour



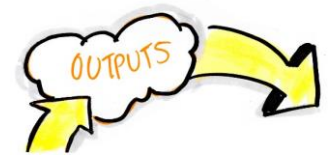
WP1: Project management

WP2: Dissemination & Exploitation

WP5: Quantification



WP4: Citizen & stakeholder engagement



WP6: Policy & governance



Innovative concepts for EI's community

◆ *Integration between emissions and carbon footprint*

According to H2020 topic "Improving the Air Quality and Reducing the Carbon Footprint of European Cities" an integrated tool for emission inventory and carbon footprint evaluation is under development

◆ *Emissions by citizens' behaviour*

Clair-City will apportion air pollution emissions and concentrations, carbon footprints and health outcomes by city citizens' behaviour and day-to-day activities in order to make these challenges relevant to how people chose to live, behave and interact within their city environment (we only introduce the topic and we will fully report next years, if possible)





Integrating air pollutant emissions & carbon footprint evaluation why (1)

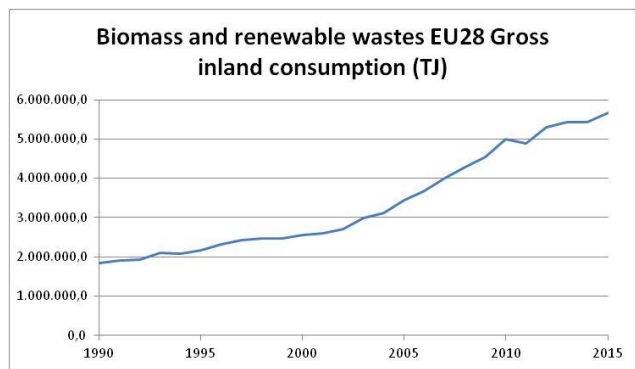
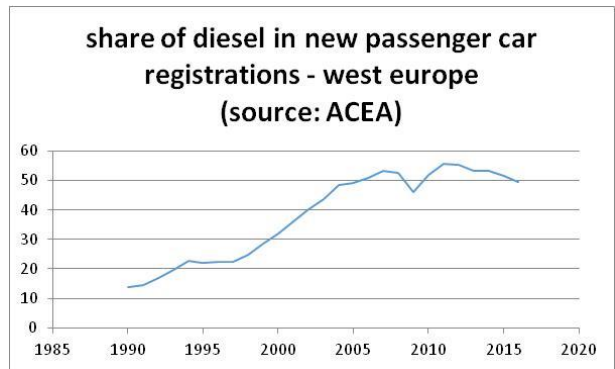
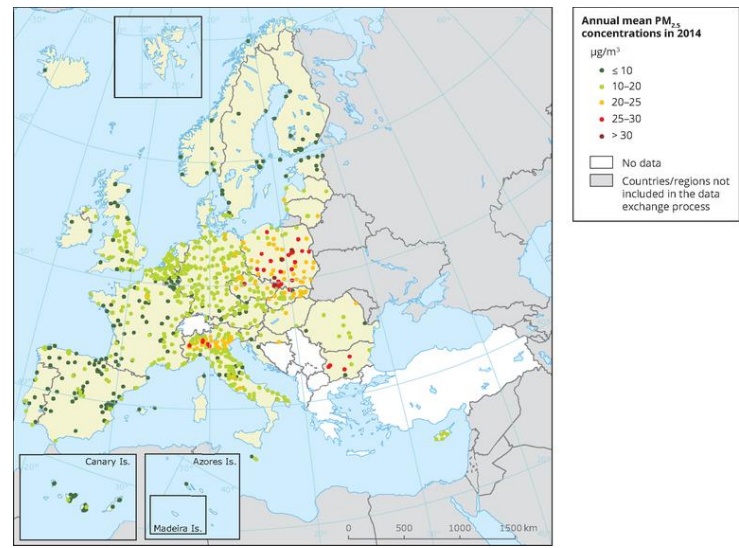
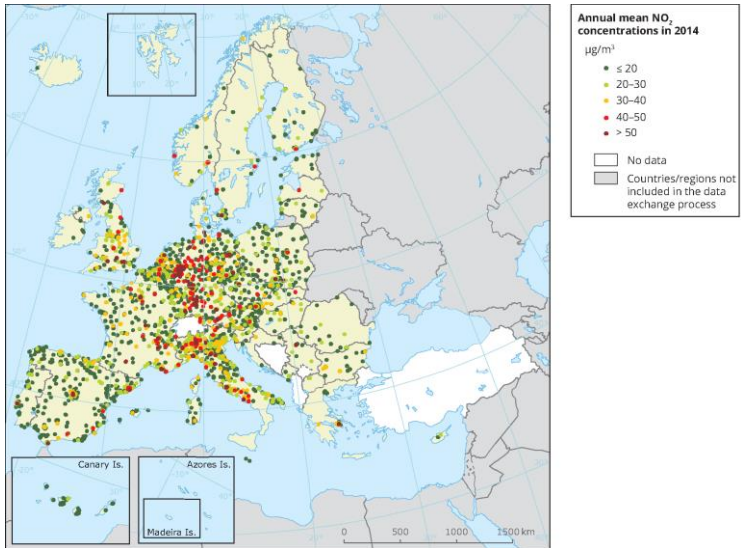
- ◆ *In the past years air pollutants (APs) and GHGs data have been poorly integrated with the consequence that climate and air pollution policies have followed distinct paths and have often been in conflict, particularly in cities*
- ◆ *Some climate oriented policies was in contrast with of the two main problems in our cities in Europe*
 - ◆ *Nitrogen dioxides urban pollution with **diesel penetration in private transport (main responsible for NOx emissions)***
 - ◆ *PM₁₀ regional and urban pollution with **biomass consumptions increment (main responsible for PM emissions)***





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Integrating air pollutant emissions & carbon footprint evaluation why (2)





Integrating air pollutant emissions & carbon footprint methodologies

- ◆ *Carbon footprint calculation methodologies usually follow the “emission inventory” or the “consumption-based” approaches.*
- ◆ *The “emission inventory” approaches, selected for the project, usually include generating GHG emissions activities that occur inside the city boundary as well as outside the city boundary*
- ◆ *The “consumption-based” approaches focus on the consumption of all goods and services by residents of a city and usually is based on input–output models*



CF “emission inventory” approaches

- ◆ *The approaches of this category usually group emissions into three categories based on where they occur: scope 1, scope 2 or scope 3 emissions*
- ◆ *This approaches distinguish between emissions that physically occur within the city (scope 1), from those that occur from the use of electricity, steam, and/or heating/cooling supplied by grids which may or may not cross city boundaries (scope 2), from those that occur outside the city but are driven by activities taking place within the city’s boundaries (scope 3)*
- ◆ *Scope 1 emissions may also be termed “territorial” emissions, because they are produced solely within the territory defined by the geographic boundary*





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CF “consumption-based” approaches

- ◆ *Evaluate the consumption of all goods and services by residents of a city and use EFs expressed as emissions for unit of good and services including all the processes (production, transport, disposal) involved in its use*
- ◆ *GHG emissions are reported by consumption category rather than by emission source categories*
- ◆ *GHG emissions are allocated to the final consumers of goods and services, rather than to the original producers of those GHG emissions*
- ◆ *Consumption-based inventories typically use an input-output model, which links household consumption patterns and trade flows to energy use and GHG emissions*





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ClairCity approach

- ◆ ***Clair city approach is to evaluate in an integrated way emission inventory and carbon footprint***
- ◆ ***Future scenarios will be produced for simultaneous reduction of air pollutants emission and carbon footprint***
- ◆ ***As the project is finalized to produce strategies for the cities the carbon footprint evaluation will be conducted following an emission inventory approach similar to the approach followed in the Covenant of Mayors and using both:***
 - ◆ ***"Standard" emission factors in line with the IPCC principles***
 - ◆ ***LCA (Life Cycle Assessment) emission factors, which take into consideration the overall life cycle of the energy carrier***



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“Standard” emission factors

- ◆ ***cover all the CO₂ emissions that occur due to energy consumption within the territory of the local authority, either directly due to fuel combustion within the local authority or indirectly via fuel combustion associated with electricity and heat/cold usage within their area.***
- ◆ ***are based on the carbon content of each fuel, like in national greenhouse gas inventories in the context of the UNFCCC and the Kyoto protocol***
- ◆ ***CO₂ emissions from the sustainable use of biomass/biofuels, as well as emissions of certified green electricity, are considered to be zero***



Life Cycle Assessment emission factors

- ◆ *includes not only the emissions of the final combustion, but also all emissions of the supply chain*
- ◆ *includes emissions from exploitation, transport and processing (e.g. refinery) steps in addition to the final combustion*
- ◆ *hence includes also emissions that take place outside the location where the fuel is used*
- ◆ *the GHG emissions from the use of biomass/biofuels, as well as emissions of certified green electricity, are higher than zero*
- ◆ *are based on a European Reference Life Cycle Database (ELCD) of JRC used in Covenant of Mayor SEAP methodology*





Emissions by citizens' behaviour (1)

- ◆ *ClairCity changing the focus from being about technology and technological solutions to problems, and examining the role of people and society in creating pollution*
- ◆ *In order to have a future low-emission city it will be necessary to change the elements of essential day-to-day practices to not just provide the physical infrastructure, and the tools and equipment for people to behave sustainably, but also to change the meanings around activities and knowledge about how things are done so as to make them part of the culture.*
- ◆ *Part of that is through the actions of individuals, but the greater part is by changing the collective conventions about how practices are done*



Emissions by citizens' behaviour (2)

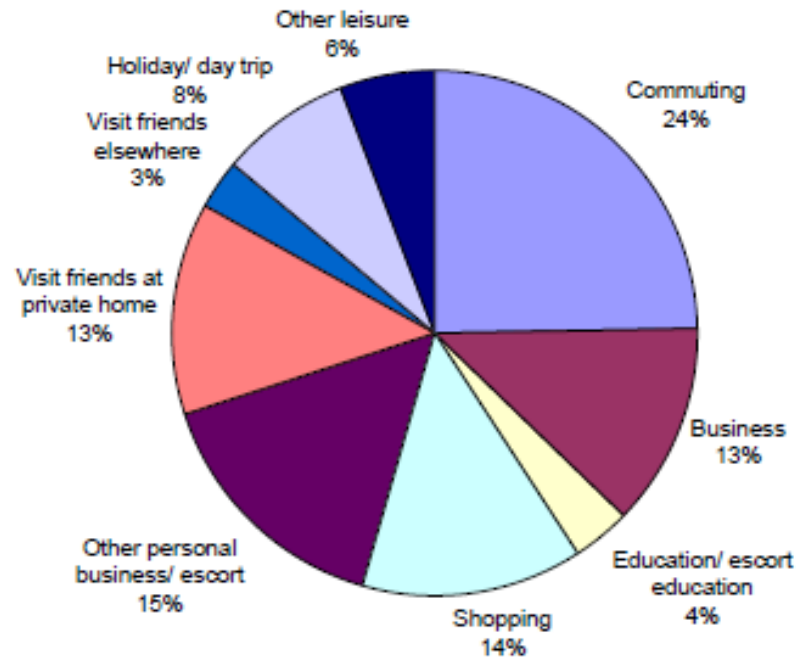
- ◆ *This task, lead by University of West of England, will develop models (mathematical functions and quantitative relationships) that will allow traditional activity based emission factors be disaggregated by practice-activities*
- ◆ *For example the aims of project, in the predominantly transport focused, are to better account for information on the origins and destinations of vehicle journeys in order to allow a new social and spatial source apportionment that rather than just attributing pollution to categories of vehicles (car, truck, bus etc.), can attribute pollution (particularly in hotspots) also on the basis of who is doing the travelling and what type of journey they are making*



Emissions by citizens' behaviour (3)

emissions from CO₂ divided by a range of journey purposes

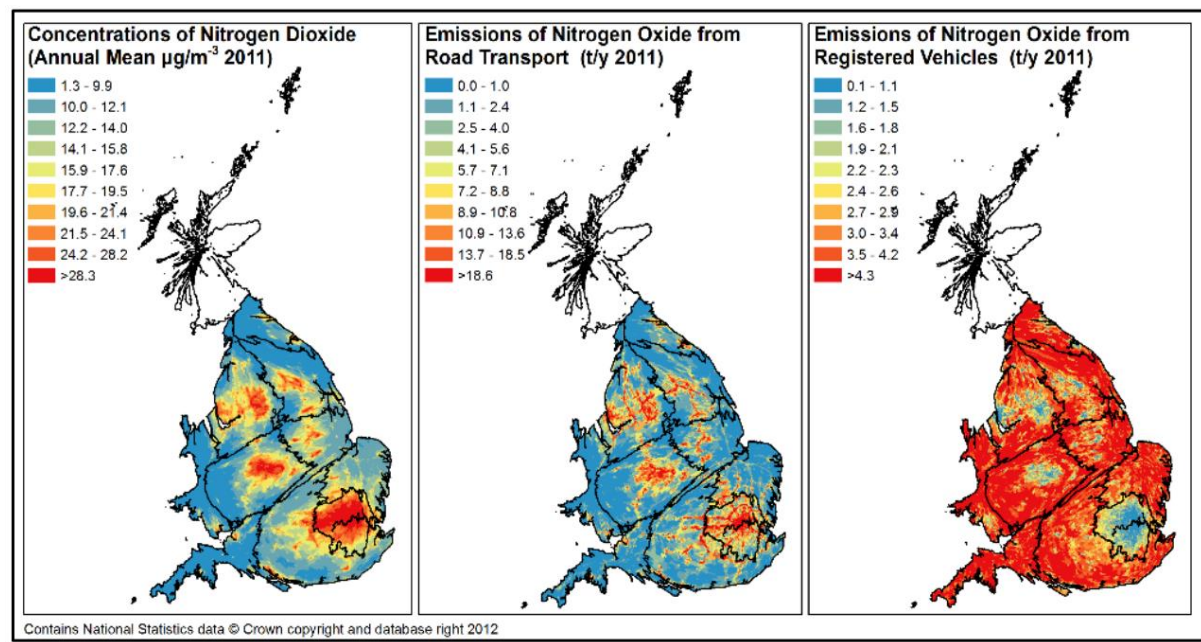
Figure 3.3: Estimated CO₂ emissions from all modes of passenger transport by journey purpose, GB, 2002/2006 average



Source: DfT analysis

Emissions by citizens' behaviour (4)

The picture gives an indication of how radically different the distribution of pollution appears if emissions are attributed to the registered location of the vehicle owners rather than the point of use





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Associate to the project (1)

- ◆ ***In order to extend the impact of the project, disseminate the outcomes and embed knowledge exchange as a core principle we actively seek to engage with other cities and organizations (companies/institutions/NGOs/etc..) to become a 'ClairCity Associate'***
- ◆ ***We want to create a project community to share our ideas and results and to learn as much as possible from other initiatives across the globe***
- ◆ ***Becoming a 'ClairCity Associate' comes at no cost. At the same time, ClairCity Associates' are not eligible to access the project funding***





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Associate to the project (2)

- ◆ ***As a 'ClairCity Associate' you will:***
 - ◆ ***Have preferential access to our research information before official publication***
 - ◆ ***Get to talk to other cities and project partners***
 - ◆ ***Get invited to ClairCity annual meetings and other events***
- ◆ ***In return, what we would expect you is to support the ClairCity project by:***
 - ◆ ***Active dissemination of the project outcomes through your networks***
 - ◆ ***Enhance the project impact by broadening its reach through your networks and activities***
 - ◆ ***Actively participate in knowledge exchange and mutual learning with the ClairCity partners***

