Guidelines to Promote Passive Methods for Improving Urban Air Quality in Climate Change Scenarios

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Summary

The iSCAPE project finalised the report “Guidelines to Promote Passive Methods for Improving Urban Air Quality in Climate Change Scenarios” which aims to review and discuss the available passive control systems that aim to improve air quality in the built environment. The report provides guidelines that account for local settings, by considering the fundamental design of urban areas and the potential for low-cost retrofits for some passive methods in existing areas in the built environment.

For several years, regulatory authorities have based their strategies of improving air quality on emission reduction strategies. These strategies have furnished till 2010 the maximum potential of achieving true reductions without shifting the blame to other areas or technological sectors. Since achieving further direct emission reduction is practically difficult, it is inevitable now to endeavour in examining the potential of passive interventions. As such interventions, in this report, we examine the potential of physical passive controls (low boundary walls or noise barriers), green infrastructure (trees, hedges, green walls and/or roofs), the utilisation of photo-catalytic coatings (in road tiles or walls) and the possibilities of achieving less atmospheric pollution with intelligent urban design (transport, settlement structure, green and blue spaces), see Figure 1. Since all these domains have a long-term potential, the interventions on existing components in the built environment, implementing or relocating these structures provides a potentially low-cost option compared to other "direct" regulatory methods that were tried until now.

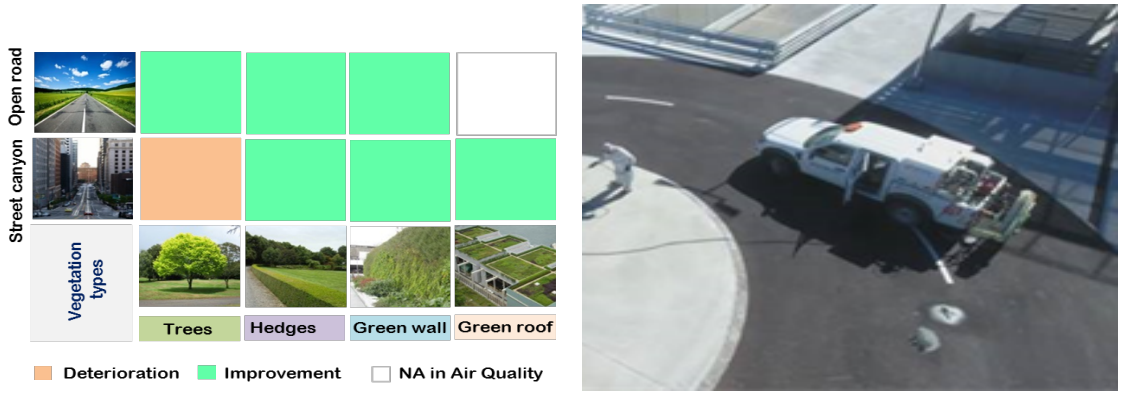

Figure 1: Different examples of passive control systems.

A significant amount of research has been carried out in the last decade on the passive systems that can improve urban air quality, with each method presenting a unique solution to the problem. However, as this research area is a relatively new area of research, this report outlines the future potential for these methods for improving urban air quality and suggests how they can be incorporated in future urban planning strategies with the link of iSCAPE challenges, this report provides thought and neutral assessment of existing and future challenges and opportunities for the cities with respect to air quality and climate change. This report addresses primarily air pollution reduction strategies and interventions and the interactions with the local and global climate and related effects such as urban heat.

With this report, we aim not only to examine the potential of these passive interventions we review the state of science in passive control systems and its characteristics. Furthermore, we review how, when and where these strategies will have benefits in urban areas. We provide conclusions about the validations, strengths and limitations. We also guide the regulatory authorities on how low-cost retrofits for some passive methods might lead to gains in urban air quality either by lowering the presence of primary air pollutants or by improving the climate parameters that are responsible for setting the background concentrations in the periphery of main anthropogenic agglomerations. At the end, we give final remarks, recommendations and guidance for which pollutants might be successfully handled by passive interventions.

The full report will be published app. at the end of 2017.

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