



Health benefits of decarbonization: The transition of carbon intensive regions in the frame of European green deal

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Health risks associated with climate changes and the issue of climatic poverty have been recently highlighted by Aurelio Tobías on this journal.¹ EU developed the “European Green Deal” as comprehensive frame to deal with these challenges, aimed at cutting emissions by 50% within 2030 and reaching climate neutrality by 2050. As recently highlighted by Director Maria Neira during the presentation of W.H.O. new Air Quality Guidelines, each increase of 10 $\mu\text{g}/\text{m}^3$ in annual average of PM_{2.5} is associated to a +7% increase in overall mortality, so that a rapid exit from fossil fuels with remarkable reductions of air pollutants will simultaneously turn into health benefits for people, in terms of avoided premature deaths and improved health. For this reason, the European Green Deal addresses also health, environmental, economic and social aspects related to climate changes.²

Carbon intensive regions of the 27 EU member States are supported in their path towards a rapid transition from coal and fossil fuels to renewable energies. The Region of Nord Pas de Calais (France) fostered environment-friendly public transportations, renewable energy production and industrial re-conversion under the REV3 (3rd industrial revolution) Program 2014-2020 thanks to 1.5 billion Euros granted by the European Regional Development Fund (ERDF) and the European Investment Bank. The JUST transition fund – which is expected to mobilise close to €30 billion of overall public investments on top of 19.2 billion Euros of EU direct contribution – has been specifically designed to assist those European areas where the conversion to a carbon-free economy is expected to produce major social impacts.³ The European Regions supported by the JUST transition fund foster **decarbonisation programs**

aimed at reducing both environmental and health consequences of heavy industrial pollution originating from fossils, as it has been recognized for the city of Taranto in Puglia, where the biggest steel production plant of Europe is located.

This plant is burning about 5 million tons of coal per year and has been potentially related to remarkable excess of mortality (1020 deaths from 2011 to 2019).⁴ Puglia Region has been proposing the switch from coal-fired to hydrogen-based electric furnaces since 2018,⁵ a perspective presented at the annual meeting of WHO Regions for Health Network (RHN), and recently assessed by the Italian Government in the frame of EU Recovery Fund.

Taranto represents a challenging case-study of transformation of existing carbon-intensive installations at European level. Actually, in recent years, decarbonisation processes of heavily polluted industrial areas have been already triggered in Germany (Duisburg), Belgium (Gand) and Spain (Asturias and Bilbao). Others have started as pilots (generally supported by the EU Research Fund for Coal and Steel), and are approaching a perspective of production on larger scale: the Salzgitter Low CO₂ Steelmaking (SALCOS) in Germany and the Voestalpein H₂FUTURE in Linz (Austria), as well as the HYBRIT and H₂ Green Steel projects in Bodenlulea region (Sweden) are aimed at producing million tons of steel through low carbon emissions processes based on hydrogen generation, carbon capture and switch to direct reduction plants, which represent the new horizon of sustainable steel production.

Declaration of interests

All the authors declare no conflict of interests.

Authors' contribution

Michele Emiliano, Prisco Piscitelli, Claudio Stefanazzi and Alessandro Miani conceived, wrote, revised and approved the manuscript.

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