

# **FACTORS AFFECTING PUBLIC AWARENESS AND ACCEPTANCE OF CO<sub>2</sub> CAPTURE, TRANSPORT AND STORAGE INFRASTRUCTURE: A TRANSNATIONAL COMPARISON**

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## **1. Introduction**

Carbon Capture and Storage (CCS) refers to the capture of carbon dioxide (CO<sub>2</sub>) from energy or heavy industry processes and its redirection to long-term geological storage structures (e.g. depleted oil wells). This way, CCS can contribute to global efforts to mitigate climate change. However, it remains a controversial technology that often faces public resistance in terms of acceptance of specific projects. Therefore, the fact that social acceptance of CCS infrastructure is a prerequisite for the further development and dissemination of this technology should not be overlooked.

## **2. Methodology**

In this context, a quantitative survey (2020) is carried out at the local level, focusing on the factors that can influence awareness and acceptance of carbon capture, transport and storage facilities, including: a) level of information, b) perceived benefits and risks, c) trust in stakeholders in terms of their intentions and capabilities, d) personal beliefs about climate

change and energy issues, e) socio-economic characteristics, f) place attachment, g) engagement activities, h) fairness (procedural and distributional) and i) other issues related to risk and safety attitudes, and general knowledge of relevant technologies.

The survey examines respondents' perceptions on the local and national level and is conducted in the 8 countries participating in the European project MOF4AIR (Metal Organic Frameworks for Carbon Dioxide Adsorption in Power Production and Energy Intensive Industries), which is funded under Horizon 2020: Belgium, France, Norway, Italy, Greece, Turkey, United Kingdom and Korea. The innovative aspects of the present study, compared to previous research performed on the subject, include a transnational comparison; a comparison between different phases (capturing, transferring, storing); a comparison between general and local acceptance; and emphasis on factors that have not been thoroughly examined yet in relation to CCS public acceptance, such as engagement activities and fairness.

### **3. Results**

Based on the conducted survey, the factors affecting the acceptance of CCS are identified on the basis of a) socio-political and community acceptance (as classified by Wüstenhagen et al. [1]) and b) acceptance of the different types of infrastructure (capture, transport and storage). In addition, factors affecting awareness of CCS are defined. Overall, the determinants of the abovementioned themes include –among others- pre-existing knowledge of CO<sub>2</sub> and CCS, trust in involved stakeholders, procedural and distributional justice, environmental attitude, perceived benefits and risks, and engagement activities. In addition, a further comparison is performed between the participating countries, taking into account not only individual characteristics, but also Hofstede's [2] cross-cultural dimensions, comprised of Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long Term Orientation and Indulgence. The statistical methods applied in relation to the above analyses include logistic regressions, structural equation modelling (SEM), and non-parametric methods (such as Kruskal-Wallis H tests).

### **4. Discussions and Conclusions**

The results of the present research can provide decision-makers and project developers / operators useful empirical findings that can assist the planning of tailor-made –based on each particular case- public awareness and engagement activities that can enhance the acceptance of the different types of CCS infrastructure on the socio-political and community level.

### **References**

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- [2] Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online readings in psychology and culture*, 2(1), 2307-0919.