Effects of text-only and text-and-visual depictions of novel energy transition technology on processing, risk perceptions and attitudes.

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Introduction

It is commonly assumed that information about complex topics such as new energy technologies or technical processes is easier to understand for a general audience when textual explanation is accompanied by visuals. Based on this assumption, recent advances in graphical technology have led to substantial investments in the creation of innovative, multimedia environments in which users can interact with information.

Taking for example the process of CO2 capture, transport and storage, companies take efforts to foster public understanding of this novel energy transition technology by providing imagery ranging from simple static overviews to animated, interactive three-dimensional depictions.

However, little is known about how any of such graphical representations actually influence information processing, understanding, and attitudes. Although research confirms that visuals can enhance understanding of a complex issue, it is not always well understood which elements of visuals sort which effect.

Taking CO2 injection as case, we designed an experiment that aims to increase understanding of the conditions under which combining textual and visual information fosters information processing about a complex, unfamiliar technology and how this in turn affects comprehension, risk perceptions, and attitudes.

An analysis of currently available visuals revealed that textual information about CO2 injection is often accompanied by a visual that does not convey the same information. One example of such 'incongruence' is the depth of injection. In text often the precise depth will be mentioned, e.g. 1,000 meters. However, depth of injection is often visualized such that the CO_2 storage seems much closer to the surface, e.g. 10 meters rather than 1,000. Observations from the field, e.g. at public meetings in Barendrecht (the Netherlands) where onshore CO_2 injection was being planned, indicate that such depictions induce worries about consequences of CO_2 leakage.

Central to this research are the following questions: (1) How does preciseness of depth indication in either text or visual influence a viewer's estimate of injection depth? (2) How does congruence versus incongruence in textual and visual indication of dept influence a viewer's estimate of injection depth? (3) To what extent does estimated depth influence perceptions of the technology, in particular perceived safety, and attitude towards CO_2 injection?

Method

We used a 3x3 experimental design with two factors. First, textual description of depth of injection (absent, ambiguous, precise). Second, visualization of depth (absent, ambiguous, precise). Subjects are a representative sample of the UK population (n = 500). The experiment is in progress, results are expected before summer.

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