Example detail

Research report: Application of life cycle assessment methodology to the understanding of the energy balance and efficiency of hydrogen value chain building blocks (Energy Institute, 1st edition, May 2022, 9781787253216) provides a comparative analysis for options in various hydrogen value chain blocks. Figure 5 is a typical output; however, Figure 5 should be read in the wider context of the Research Report (e.g., to consider assumptions).

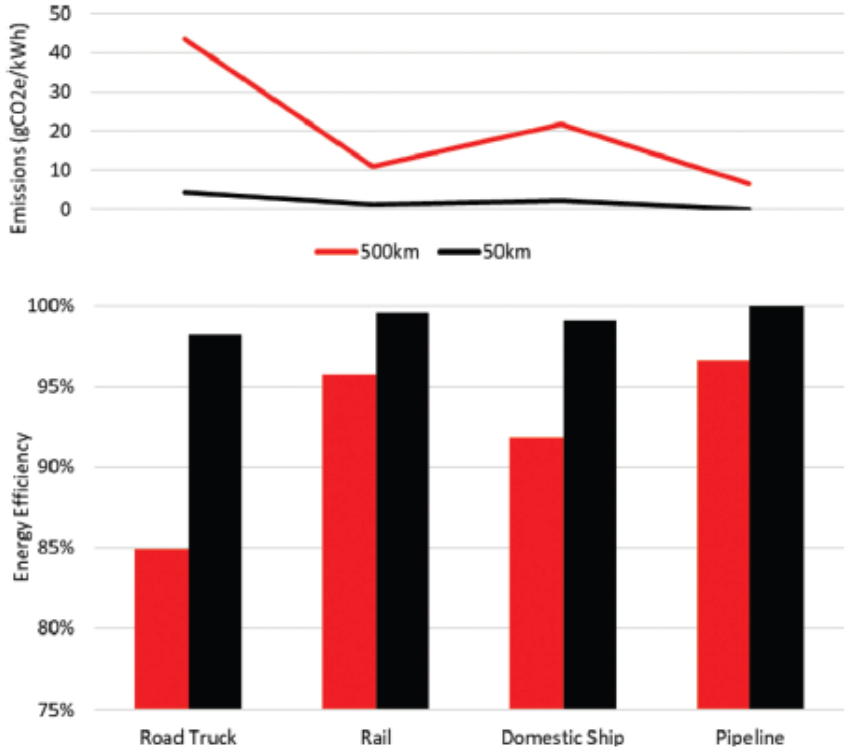

Figure 5.3: Transport of 100 % H_2 by truck, rail, domestic ship, and pipeline

Footnotes to figures:

a. Results shown for road, rail and domestic shipping are for 250 barg compressed gas; pipeline results are for 70 barg transmission in existing pipelines. Efficiency of compression prior to transport is assessed separately in 5.2.

A high-level summary of the applicability of the current legislation and regulations in respect to hydrogen applications is presented in Table 2. The high-level summary is presented on each focus area of the hydrogen applications. Table 2 should be read in the wider context of the Research Report (e.g., to consider assumptions).

(Replicated from *Research Report: Review of Directives/Regulations relevant to the safe and environmentally compliant production, transportation, and storage of hydrogen* (Energy Institute, 1st edition, September 2022, 'in press'))

Table 2: Legislative review: summary of findings

Focus area	Observation
Safety case/ reports	Clear regulations for onshore hydrogen production and storage – particularly the Control of Major Accident Hazards (COMAH) and the Planning Regulations where hydrogen is specifically listed as a dangerous substance There are no regulations covering offshore hydrogen production
Design and asset integrity	Clear scope and limitation on hydrogen application, but there is no comprehensive regulation covering the end-to-end process
Pipeline	Generic regulation covers offshore and onshore hydrogen pipelines. Hydrogen is not explicitly listed, but it is covered under the definition of flammable fluid
Transportation	Clear application on bulk road transport of hydrogen – mostly generic regulations where hydrogen is covered under the definition of dangerous goods
Gas safety	GSM(R) written for natural gas distribution. GS(M)R does not specifically address hydrogen, except restricting the maximum concentration of hydrogen in gas stream (max. 0,1 %-mol)
Emergency response	Generic regulations applying to hydrogen
Environmental permitting	Hydrogen production activity is listed under the regulated installations covered by this legislation, regardless of the production methods or raw materials used