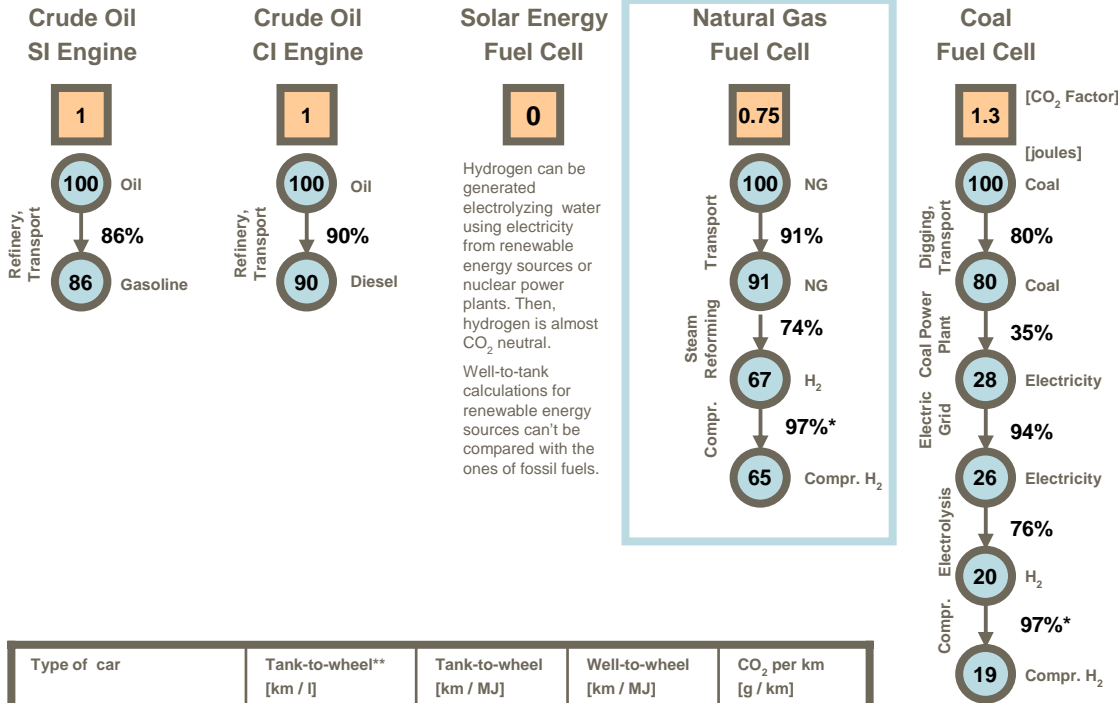
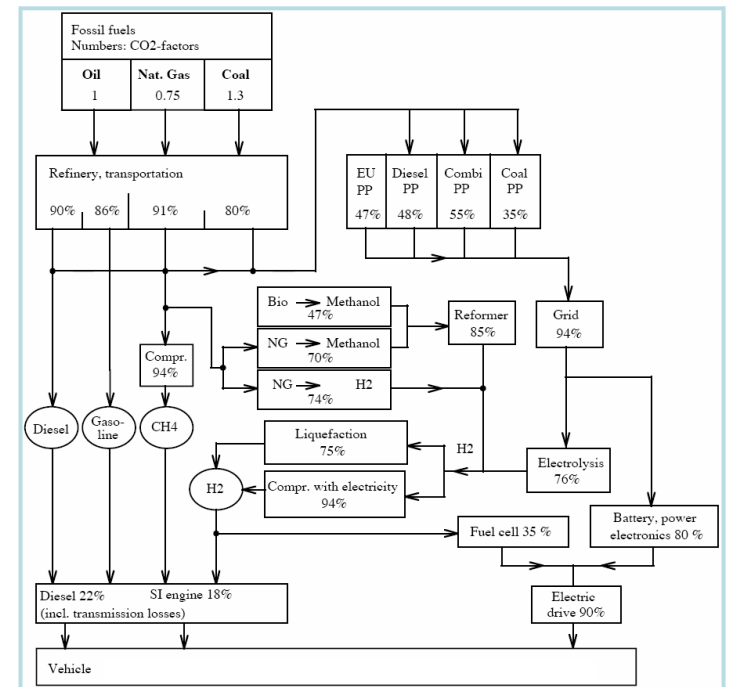


# Well-to-tank efficiencies and CO<sub>2</sub> -factors compared



Type of car	Tank-to-wheel** [km / l]	Tank-to-wheel [km / MJ]	Well-to-wheel [km / MJ]	CO <sub>2</sub> per km [g / km]
SI-engine Univ. Paul Sabatier (F)	2560	79.5	68.4	1.08
CI-engine Schluckspecht FH Offenburg (D)	1807	56.1	50.5	1.46
FC Pac Car II ETH (CH), realistic	5385	167.3	108.7	0.51
FC Pac Car II ETH (CH), worst case	5385	167.3	31.8	3.03

Gasoline data used: density 0.74kg/l, lower heating value 43.5 MJ/kg, CO<sub>2</sub> emission per energy 74g CO<sub>2</sub>/ MJ



Different paths to convert a primary energy source to mechanical energy. Source: Dones R, Bauer C, Bolliger R, Burger B, Faist M, Frischknecht R, Heck T, Jungbluth N, Röder A (2004) Sachbilanzen von Energiesystemen: Grundlagen für den ökologischen Vergleich von Energiesystemen und den Einbezug von Energiesystemen in Ökobilanzen für die Schweiz. Final report ecoinvent 2000 no. 6., Paul Scherrer Institut

**Abbreviation and Explanations**  
 CI Compression-ignited or diesel engine  
 CO<sub>2</sub>-Factor CO<sub>2</sub> emitted per energy relative to Oil  
 CNG Compressed Natural Gas  
 FC Fuel Cell  
 NG Natural Gas  
 PP Power Plant  
 SI Spark-ignited or gasoline engine  
 \*Compressed only to 11bar  
 \*\*Results from Shell Eco-marathon in Nogaro 2005 and Ladoux 2005, distance per gasoline equivalent