

A man with a mustache, wearing a white lab coat, is focused on adjusting a large, dark piece of machinery. The scene is lit with a cool, blueish light. Overlaid on the image are several orange technical diagrams, including a circular schematic with arrows and labels, and a complex circuit board layout with various components like resistors, capacitors, and transistors. The word "RELIATOR" is prominently displayed in the center in a bold, white, sans-serif font.

RELIATOR

The background of the slide is a technical wireframe illustration of industrial machinery, including what appears to be a robotic arm on the left and a large cylindrical vessel or reactor on the right. The lines are white and set against a background that transitions from a dark teal at the top to a bright orange at the bottom.

INNOVATIV TEKNIK FÖR FRAMTIDEN

VÅRT ERBJUDANDE

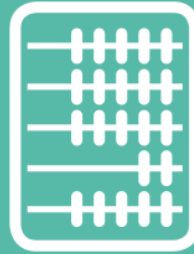




Maskinteknik



Process- och
Energiteknik



Beräkningsteknik



Projektledning
och beställarstöd



Riskanalys
och CE-
märkning

Framtid

Innovativ!

Farligt

Miljövänligt!

Explosivt

Vad är vätgas?

Fossilt

Utvecklat!

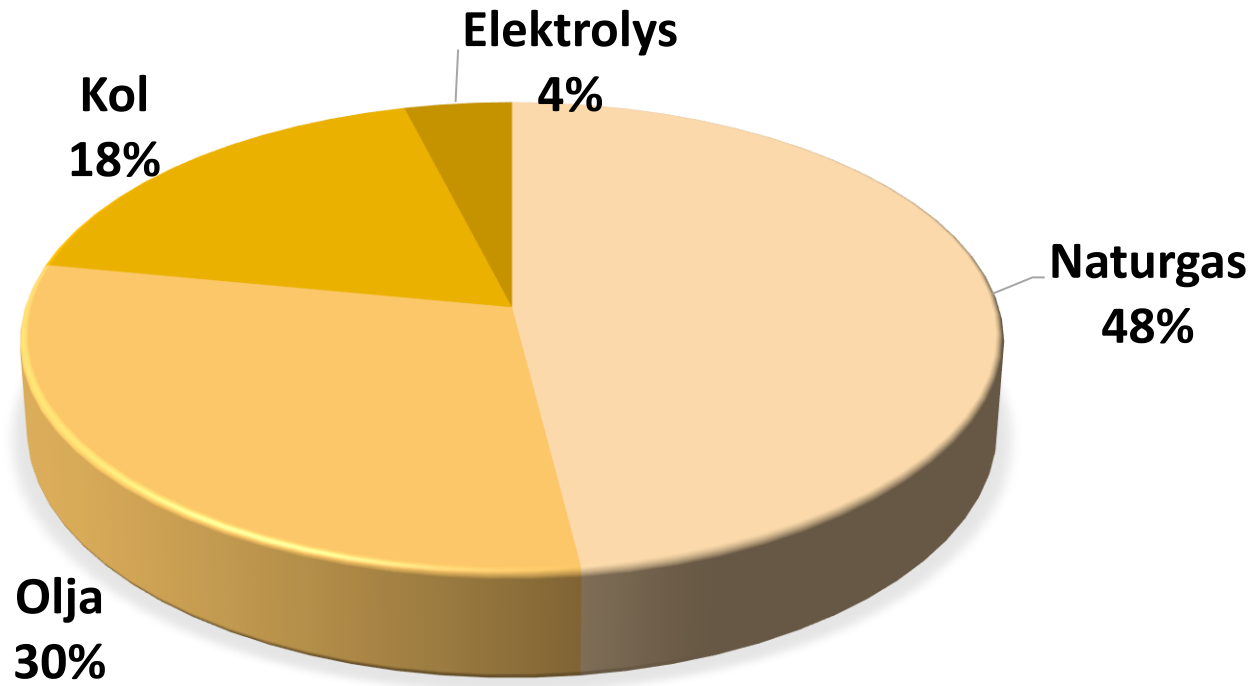
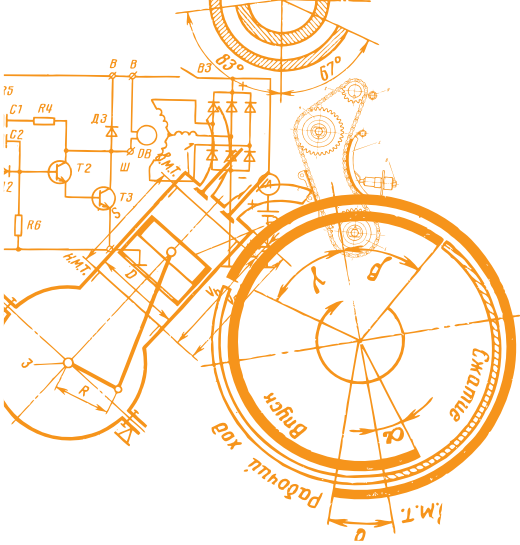
Dyrt

Bränsle

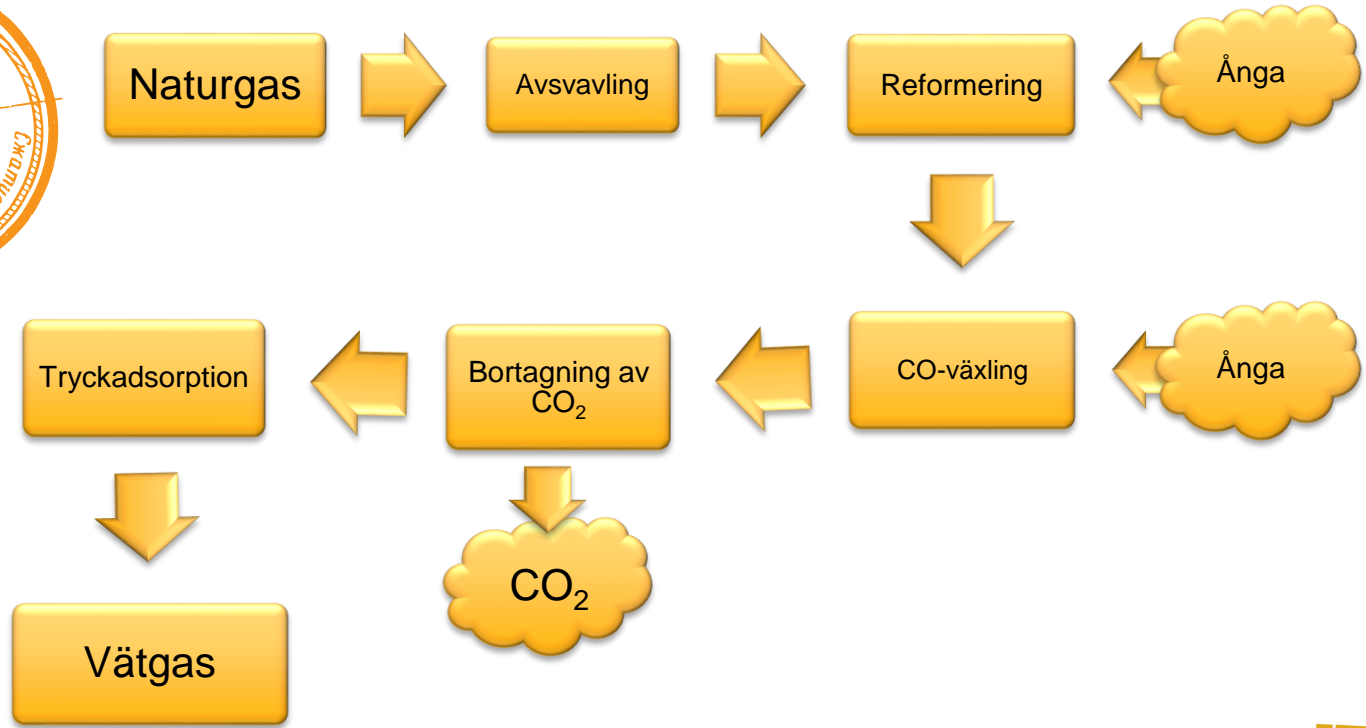
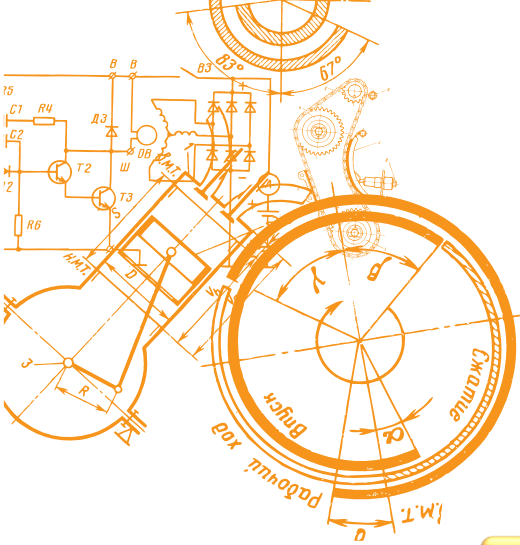
Energi

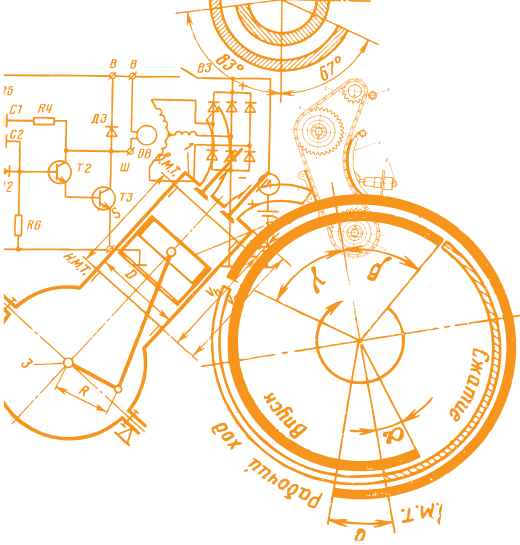
RELTOR
ENGINEERING



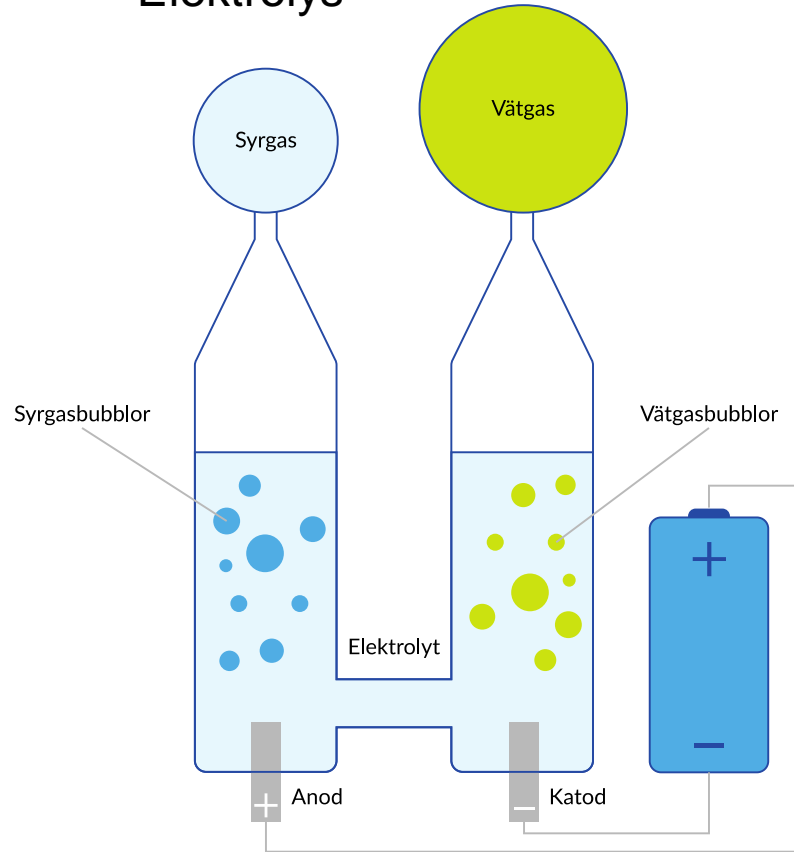


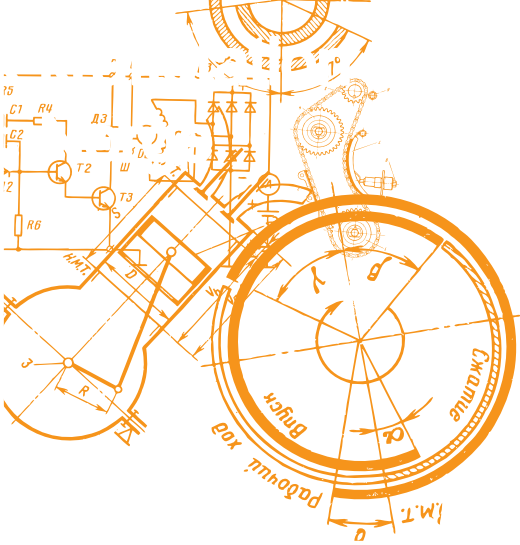
Reformering av naturgas





Elektrolyt





Vätgaslagring

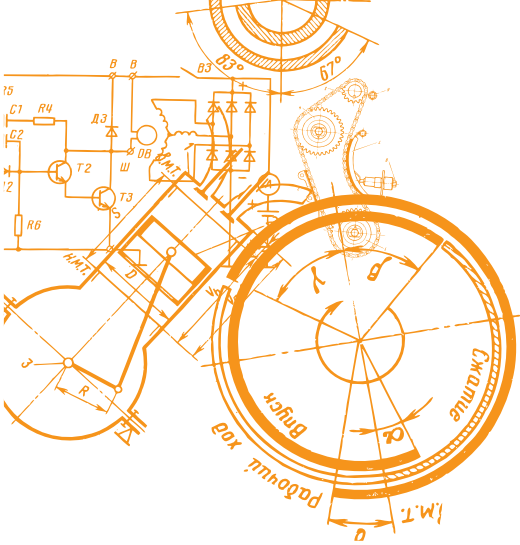
Komprimerad form
200, 550, 700 eller \approx 900 bar

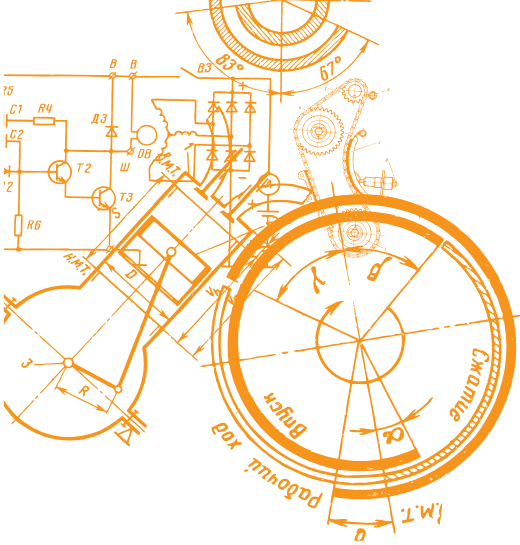


Vätgas i historien

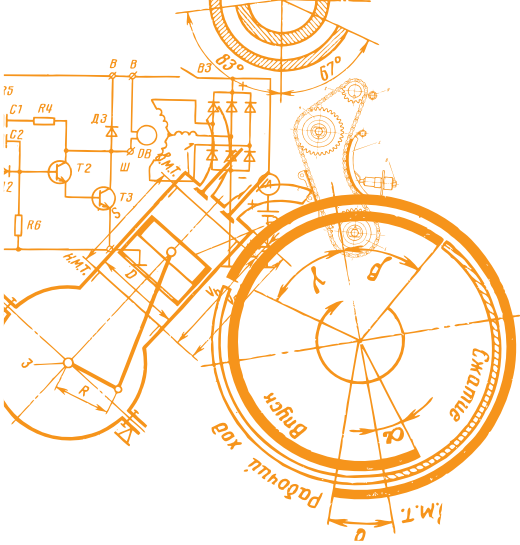


Hindenburgsyndromet

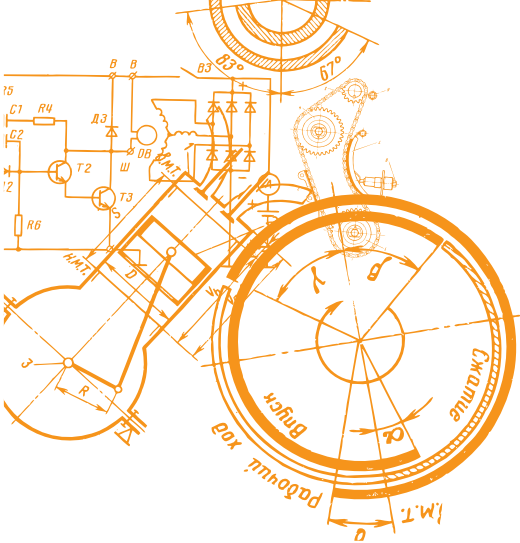




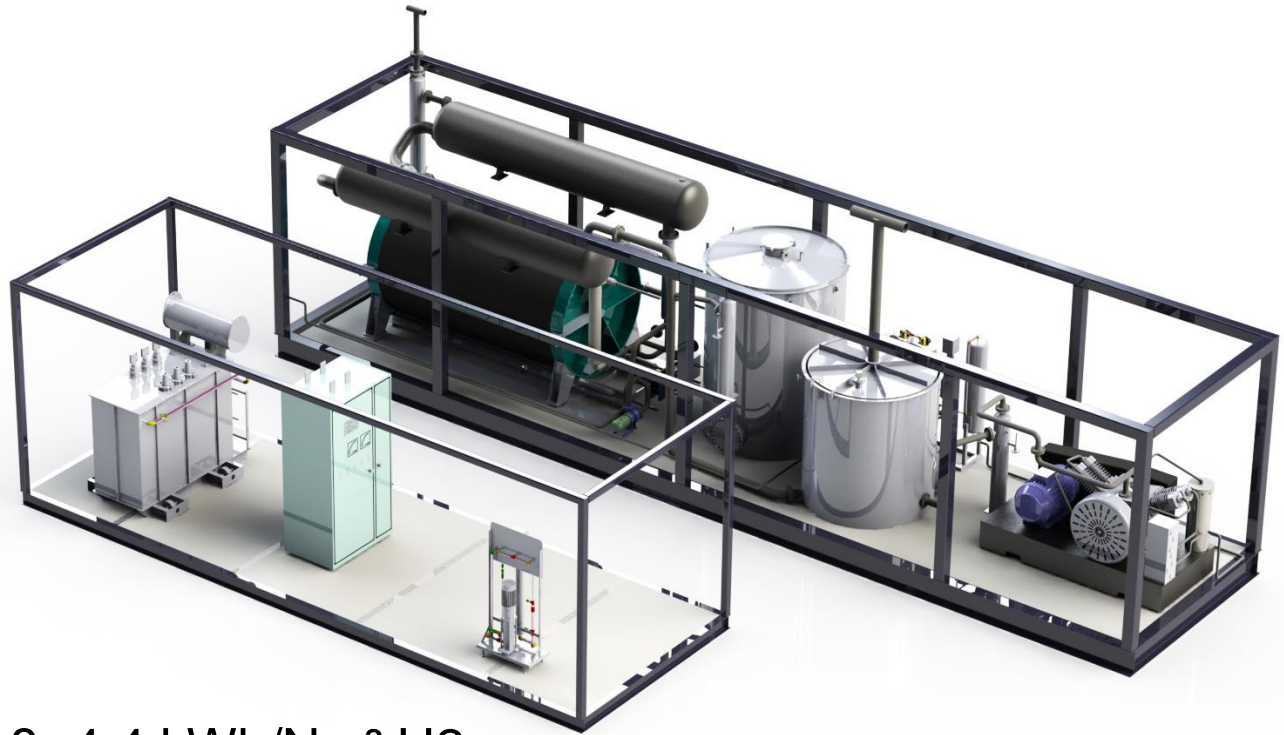
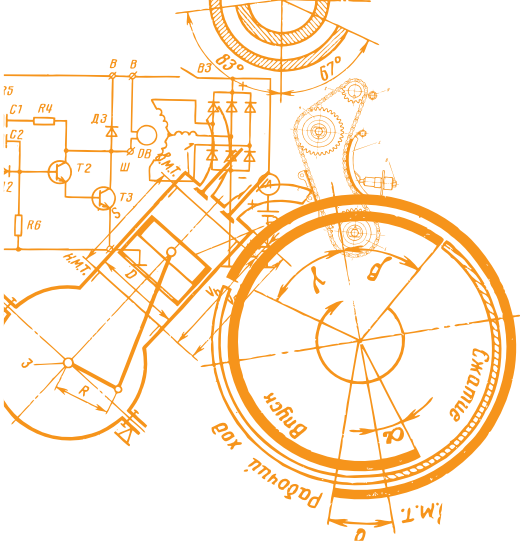
Vemork kraftstation Rjukan, Norge



Rjukan, Norge



Glomfjord, Norge

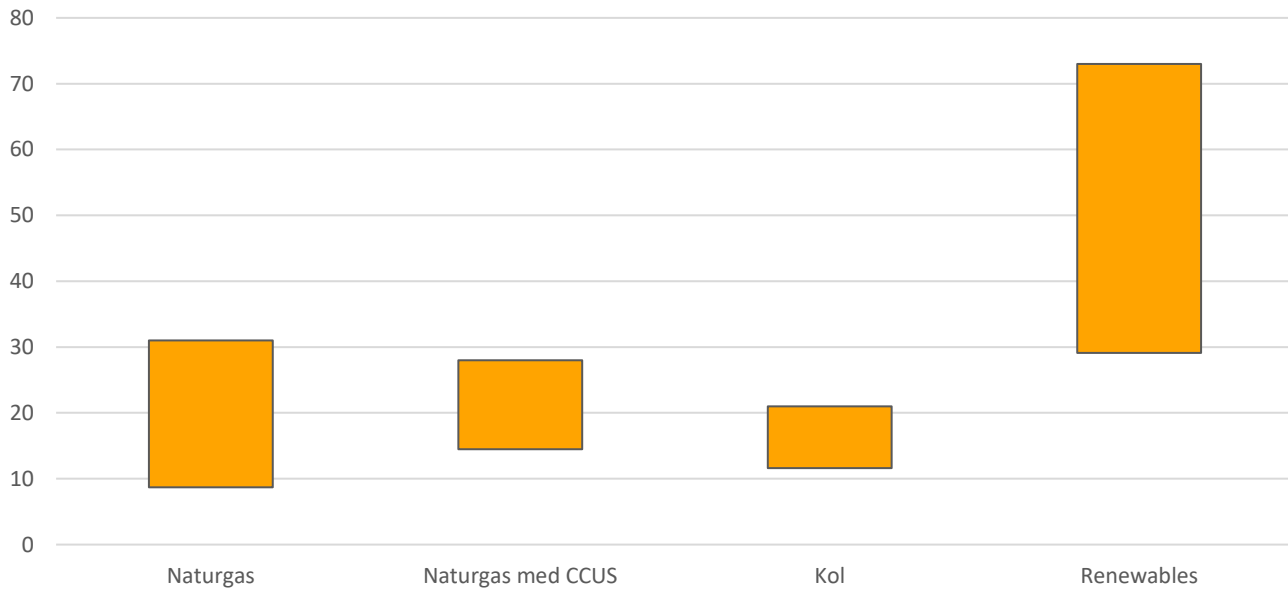
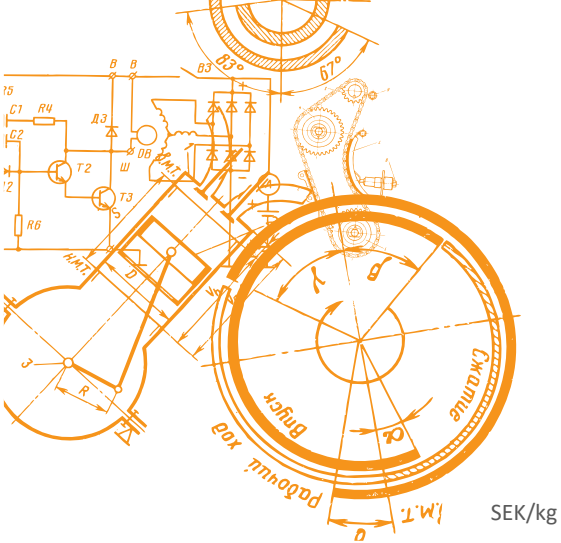


Energiförbrukning $\approx 3,8- 4,4 \text{ kWh/Nm}^3 \text{ H}_2$

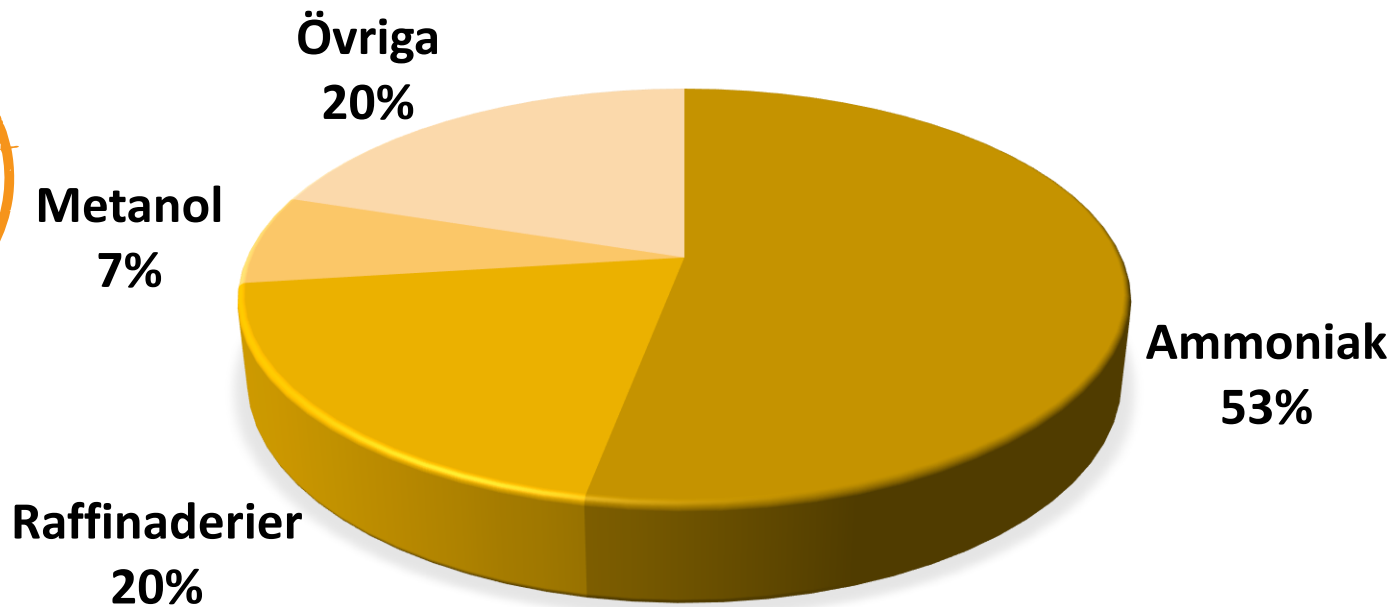
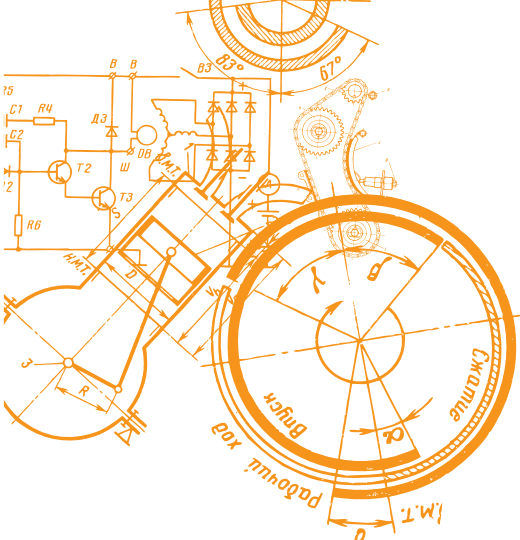
Verkningsgrad $\approx 70/80 \%$

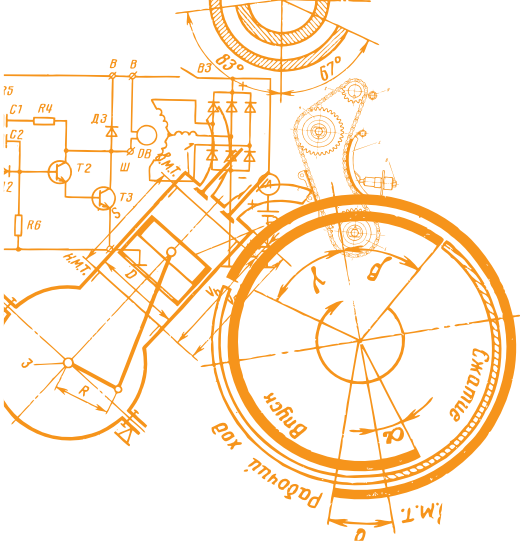
Ca 1 liter vatten per $\text{Nm}^3 \text{ H}_2$

Ekonomi



Användningsområden & Potential med vätgas





Lab applikationer

Väteperoxid, polymerer och lösningsmedel

Mättade fetter

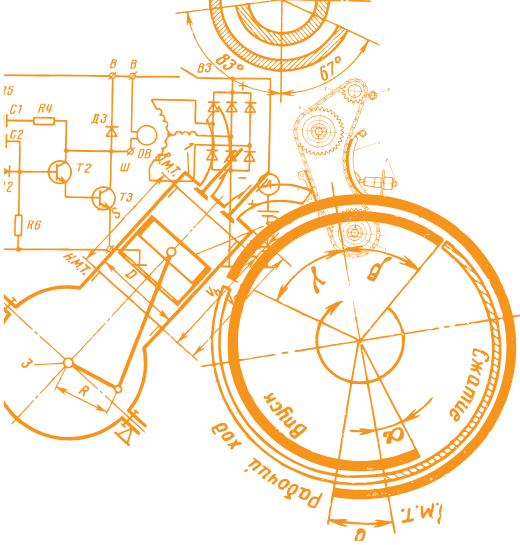
Läkemedelsindustri

Svetsning

Metallurgiska applikationer

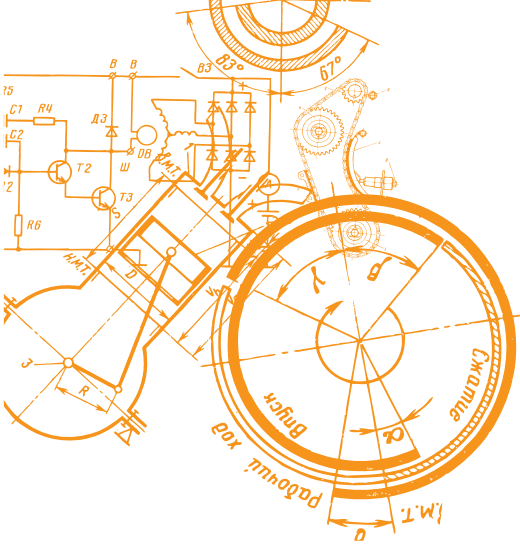
Polysilikon för wafer tillverkning (Solceller)

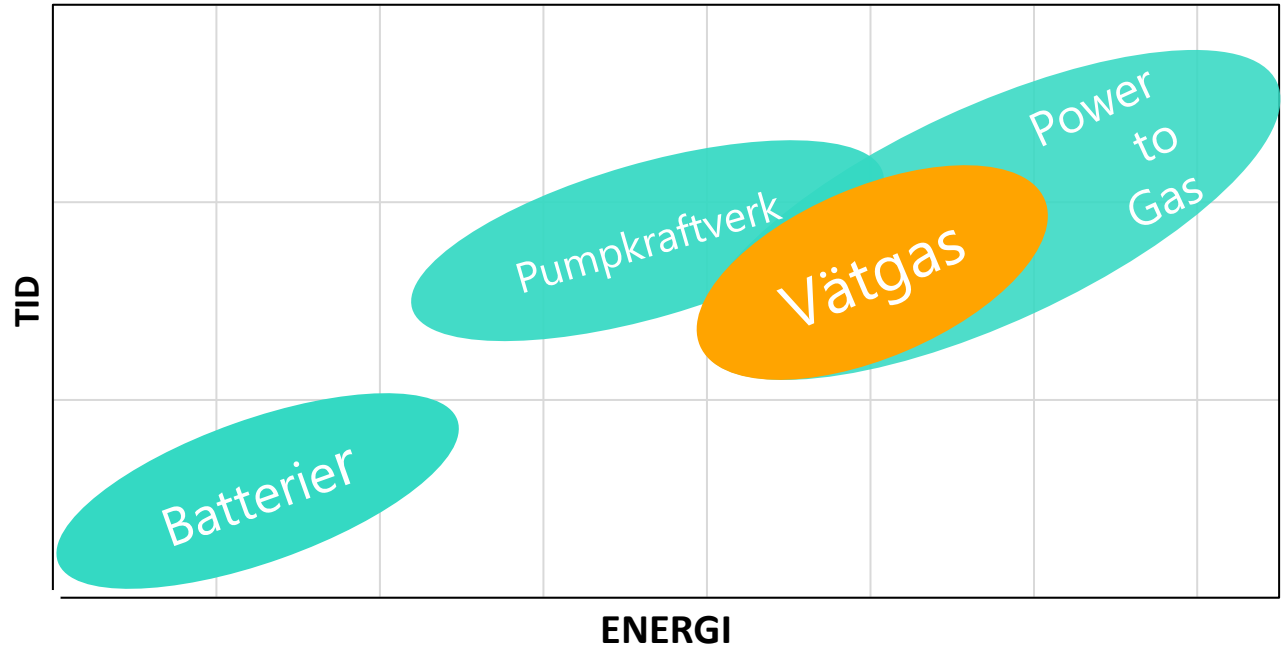
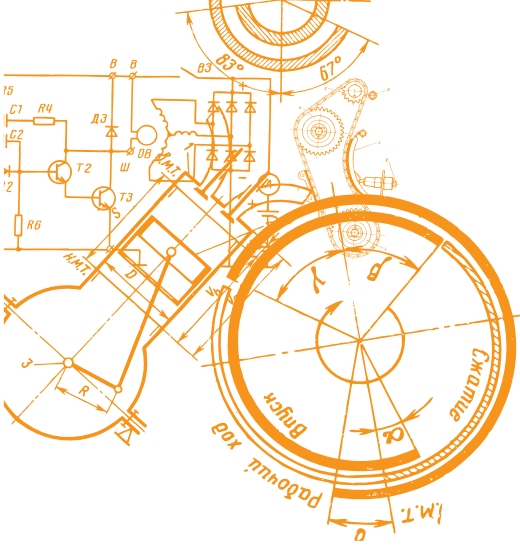
Raket bränsle (i flytande form!)



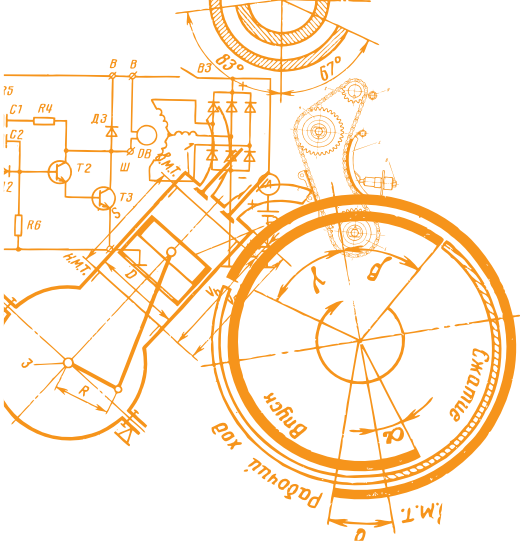
Vätgas som energibärare

Knyter behovet att storskaligt kunna lagra el
med behovet av att få fram mer förnybara
drivmedel





För- och nackdelar

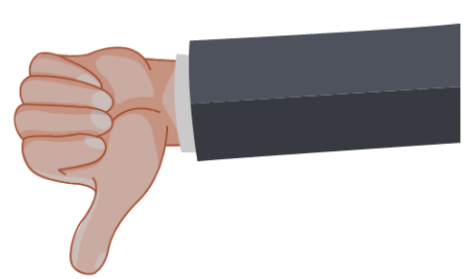
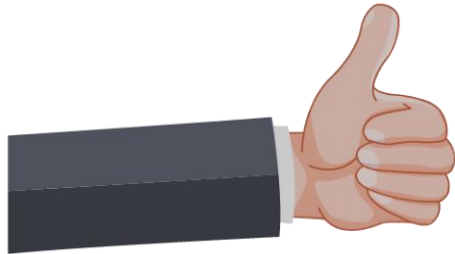


Fördelar

Ingen kolbaserade utsläpp

Känd och beprövad teknik

Hög energidensitet



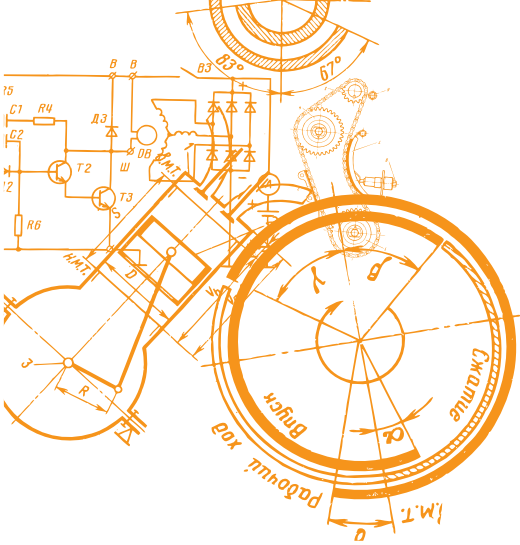
Nackdelar

Lagring kräver hög tryck

Brandfarlig och explosiv

Kostnad

Säkerhet



ATEX direktiv - 2014/34/EU

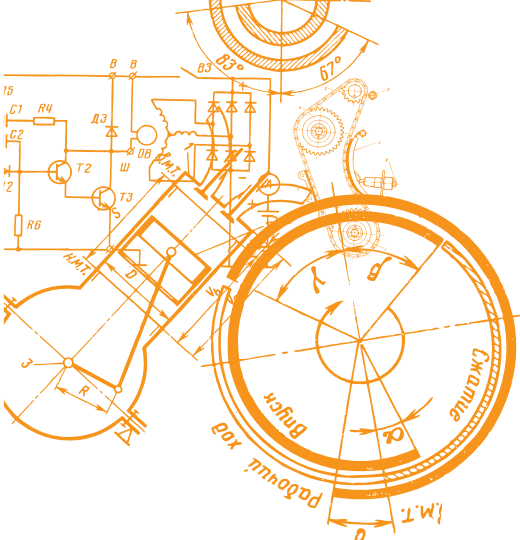
HAZOP studies - SS-EN 61882

Ex-komponenter för användning i explosiv atmosfär - SS-EN 60079-0

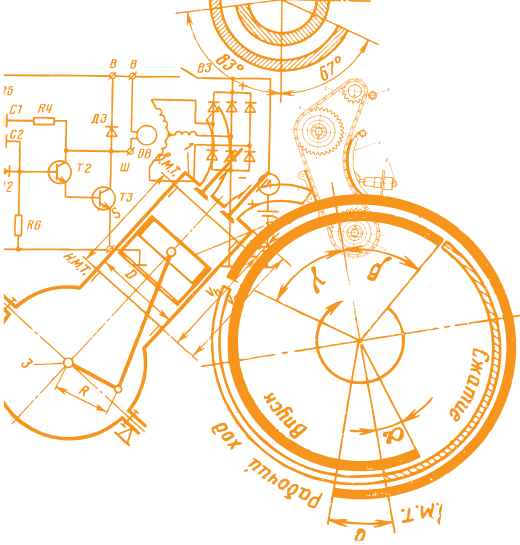
Identification and assessment of hazardous situations - SS-EN 1127

Maskinsäkerhet – SS EN ISO 12100





Om det är så enkelt...



Hinder för vätgasinfrastruktur

Politik

Okunskap

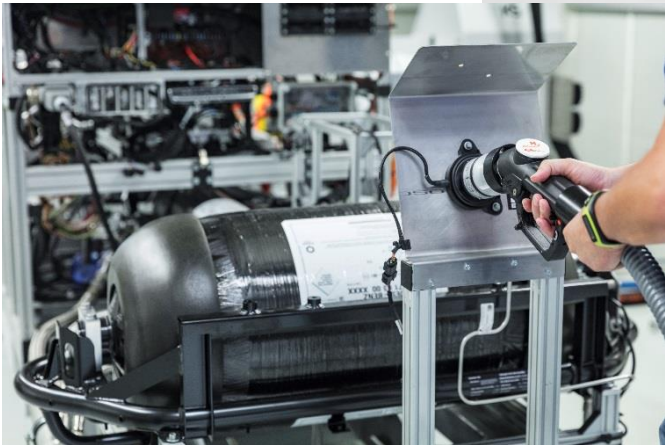
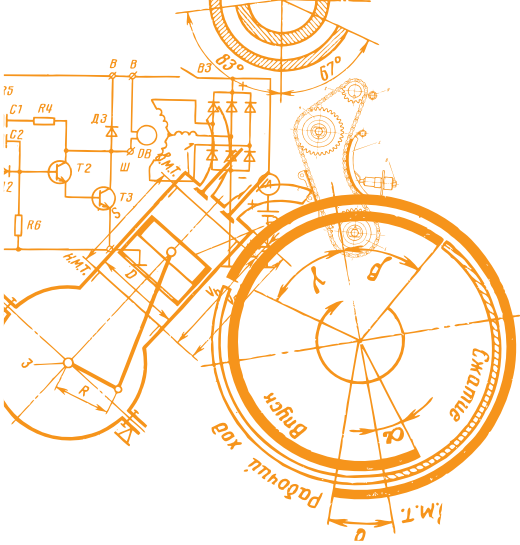
Kostnader

Samhällsvinster med vätgas

Miljövinster

Nya affärs- och produktionsmöjligheter

Försörjningstrygghet



Tack för att ni lyssnat!

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