

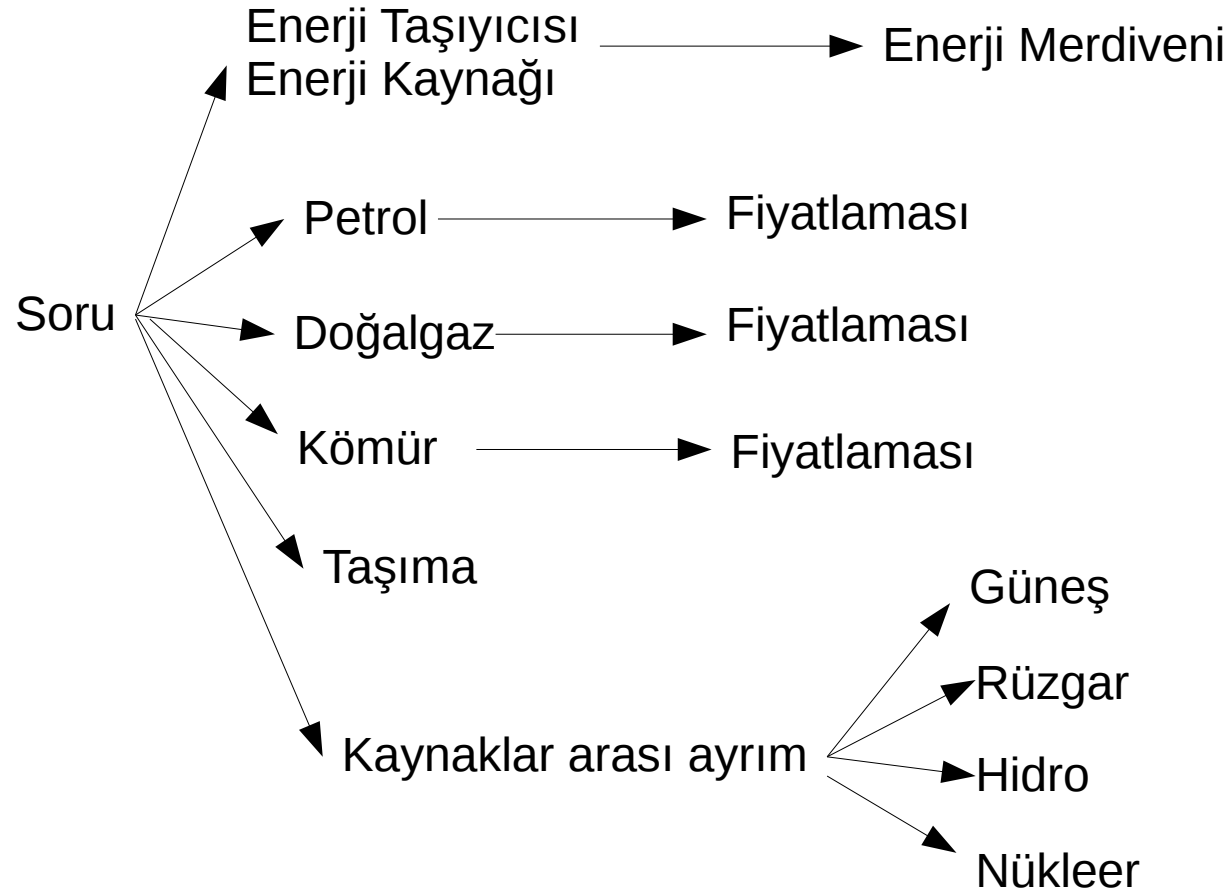


Enerji 101 – Ders 2

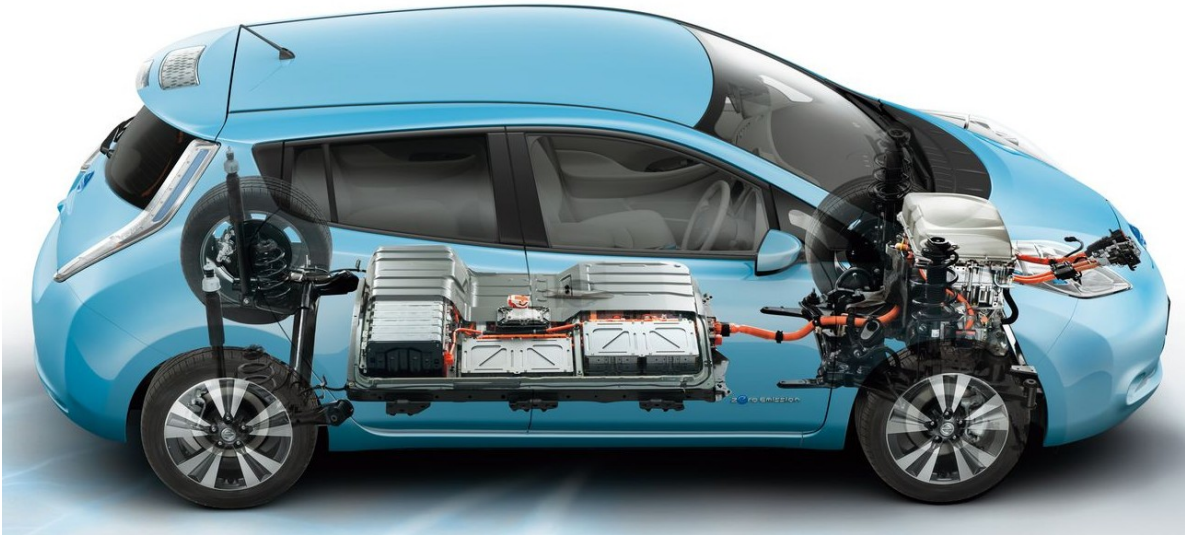
Enerji Kaynakları, Özellikleri ve Fiyatlama Yapısı

Barış Sanlı

Genel yapı



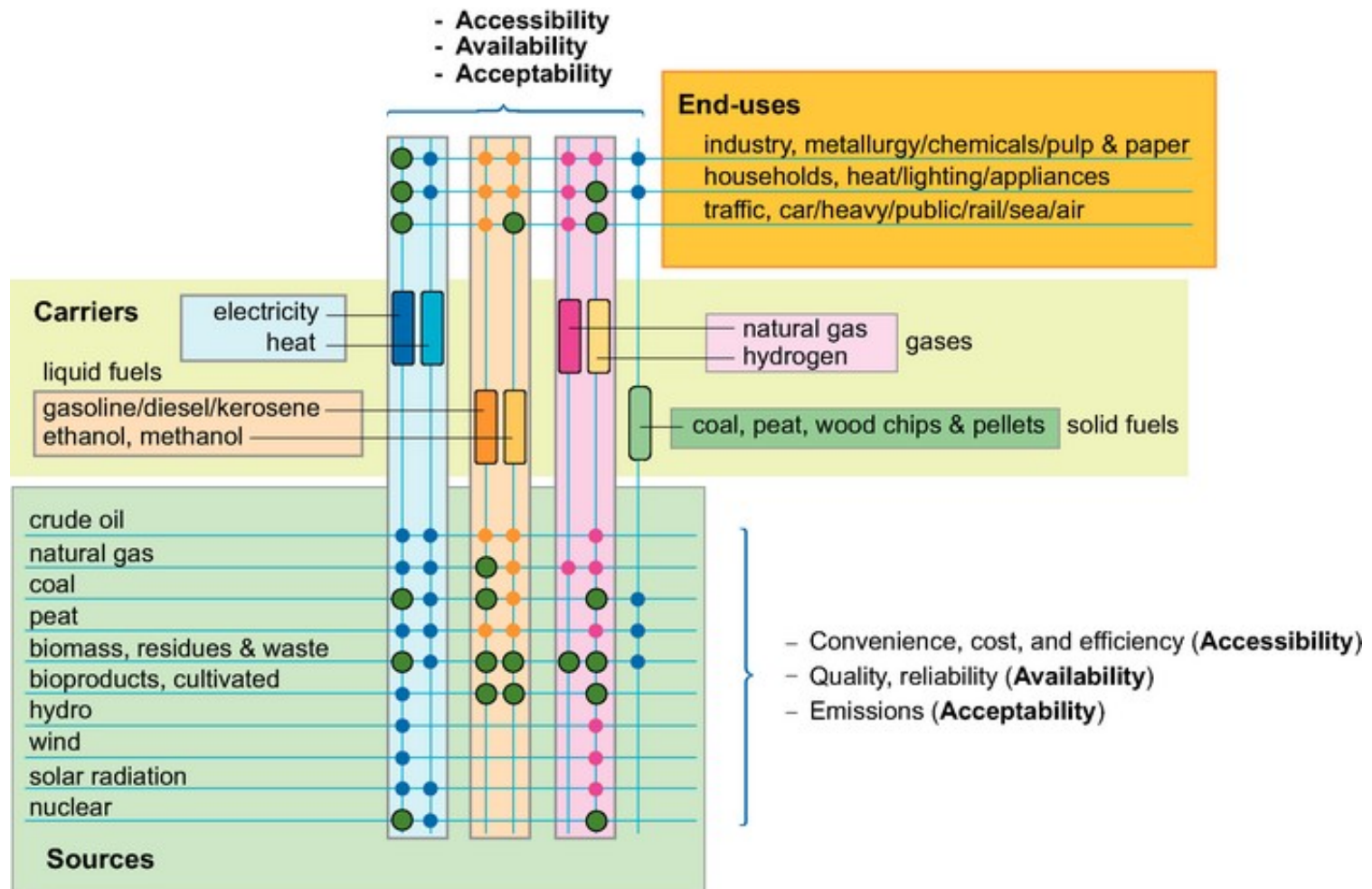
Elektrikli araba ve Elma



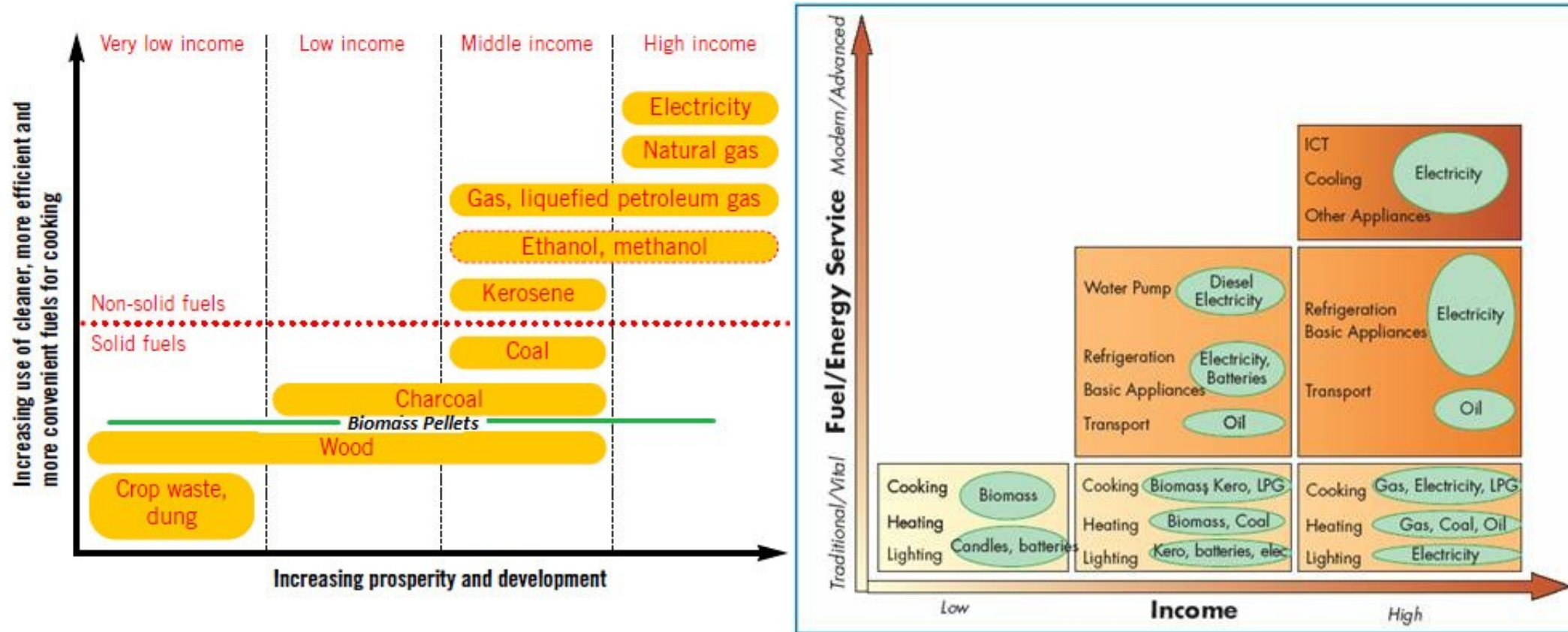
Enerji taşıyıcısı ve Enerji kaynağı

14 Sektör	10 Enerji Taşıyıcısı	18 Enerji Kaynağı
Passenger transport	 Electricity (Centralised / Distributed)	Oil
		Natural Gas
		Coal
		Nuclear
Freight Transport	 Liquid Fuels	Hydro-electricity
		Biofuels – 1st Gen
		Biofuels – 2nd Gen
		Biofuels – Marine
Residential	 Heat (Centralised/ Distributed)	Biofuels – Traditional
		Biofuels – Commercial
		Waste
		Geothermal – Hydrothermal
Industry & services	 Gaseous Fuels	Geothermal – Engineered
		Solar – Photovoltaic
		Solar – Thermal
		Wind
	 Solid Fuels	Tidal
		Wave
	 Biomass (Traditional/Commercial)	
	 Hydrogen	

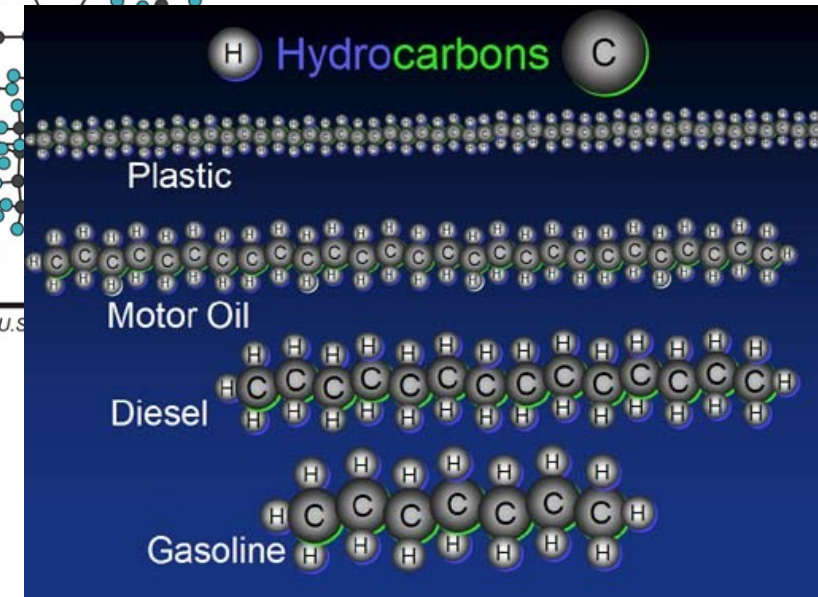
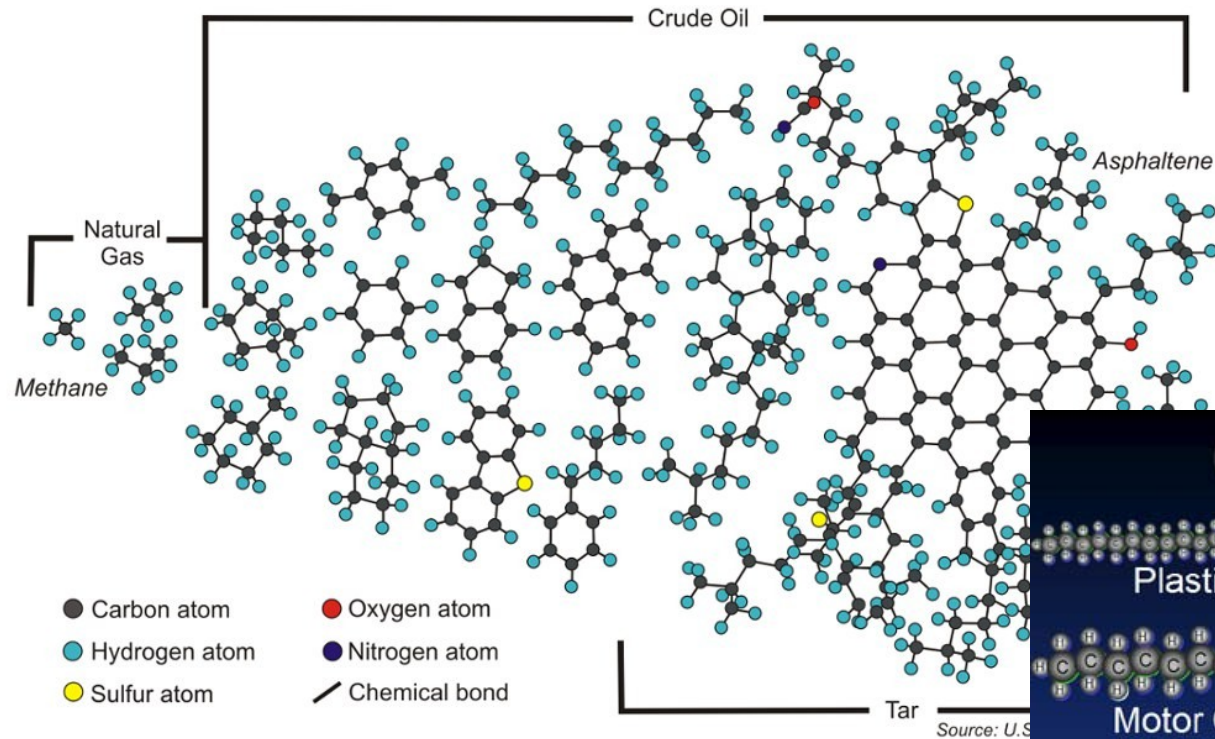
IPCC yaklaşımı



Enerji merdiveni



Petrol: Bir Kokteyl

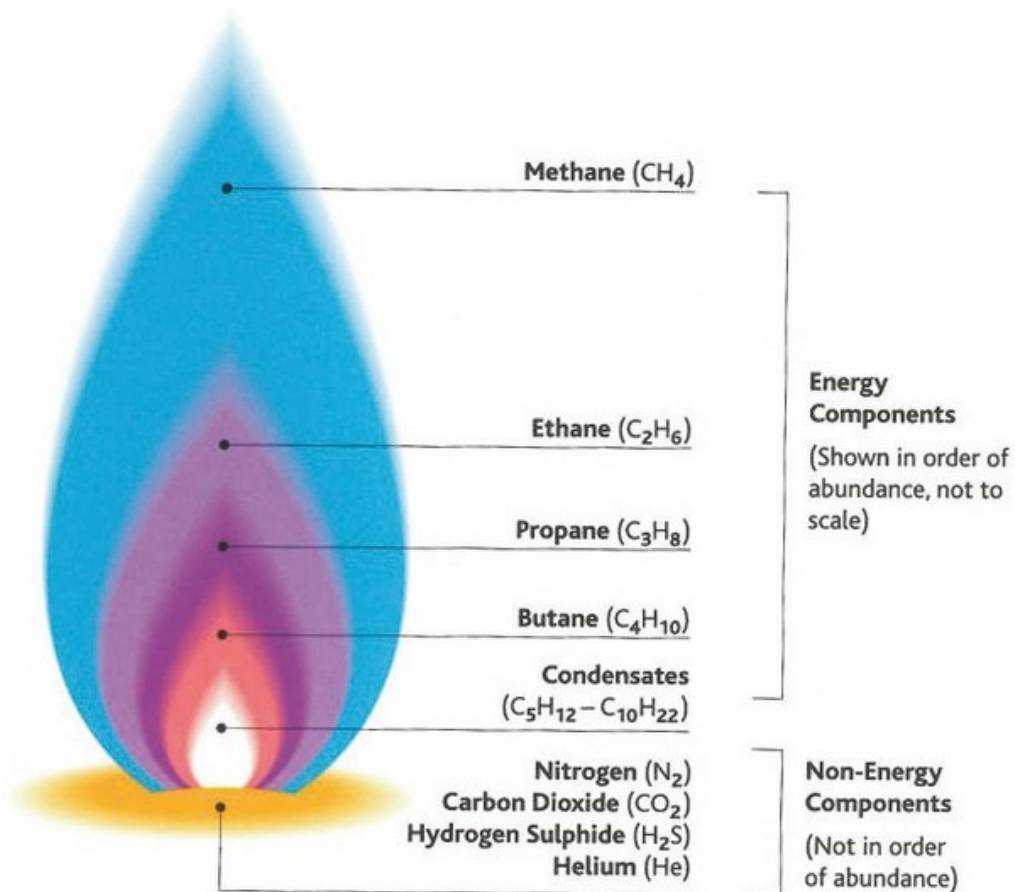


Petrol Fiyatlaması

- OSP: Official selling price
 - WTI
 - Brent
-
- NYMEX (<https://www.cmegroup.com/trading/energy/crude-oil/light-sweet-crude.html>)
 - DME (<https://dubaimerc.com/dme-data>)
 - The ICE (daha önce IPE , <https://www.theice.com/brent-crude>)
 - Shanghai Futures Exchange
(<http://www.shfe.com.cn/content/2018-yyQH-en/index.html>)

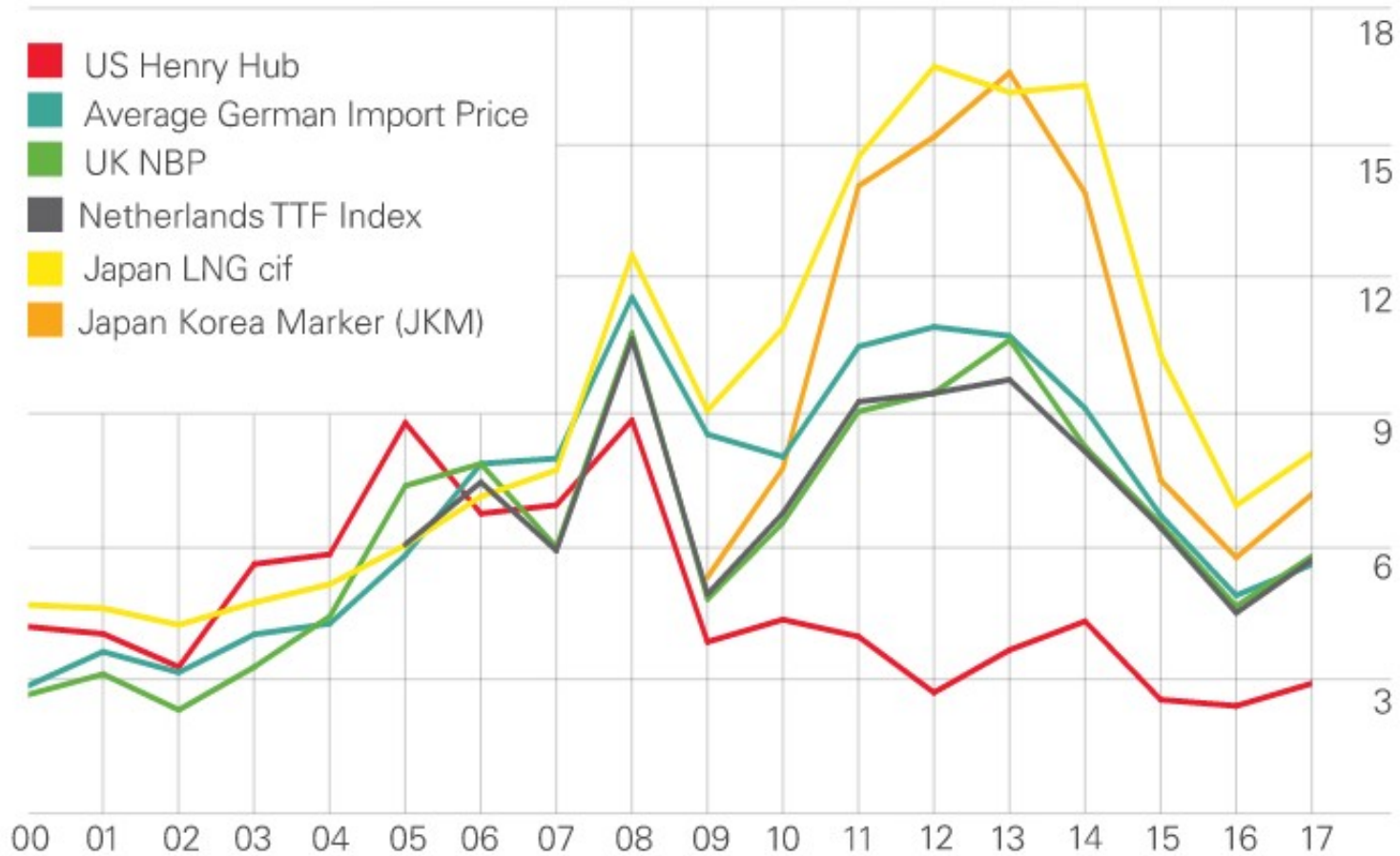
Doğalgaz

	Canada	Kansas	Texas
C1	77.1	73.0	65.8
C2	6.6	6.3	3.8
C3	3.1	3.7	1.7
C4s	2.0	1.4	0.8
C5s+	3.0	0.6	0.5
H ₂ S	3.3	0.0	0.0
CO ₂	1.7	0.0	0.0
N ₂	3.2	14.7	25.6
He	0.0	0.5	1.8



Doğalgaz Fiyatlaması

Natural gas prices (\$/mmBtu)

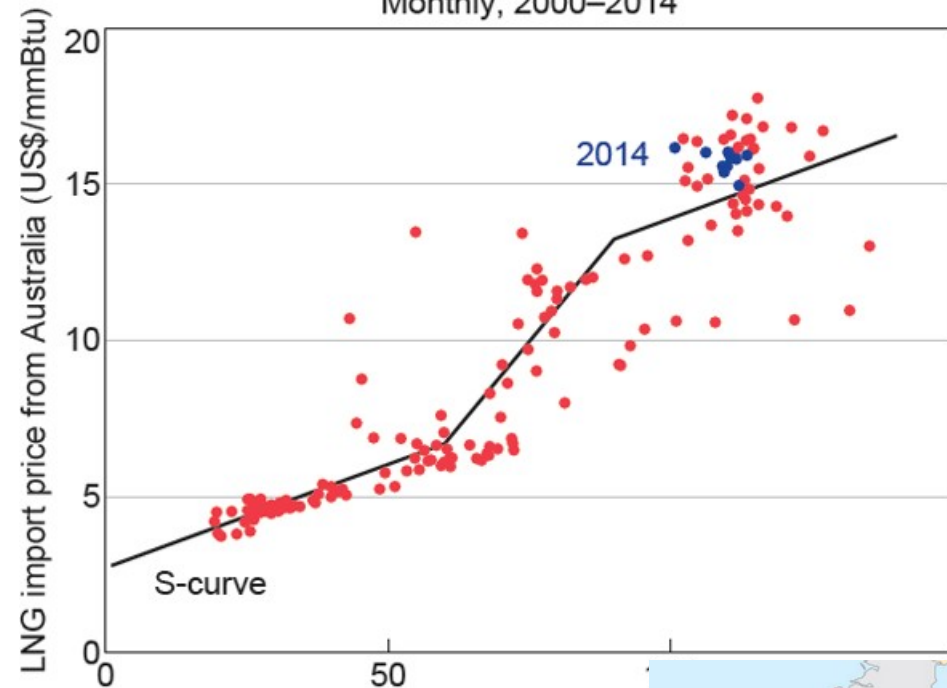


<https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/natural-gas/natural-gas-prices.html>

Farklı fiyat yapıları

Japanese LNG and Crude Oil Prices

Monthly, 2000–2014

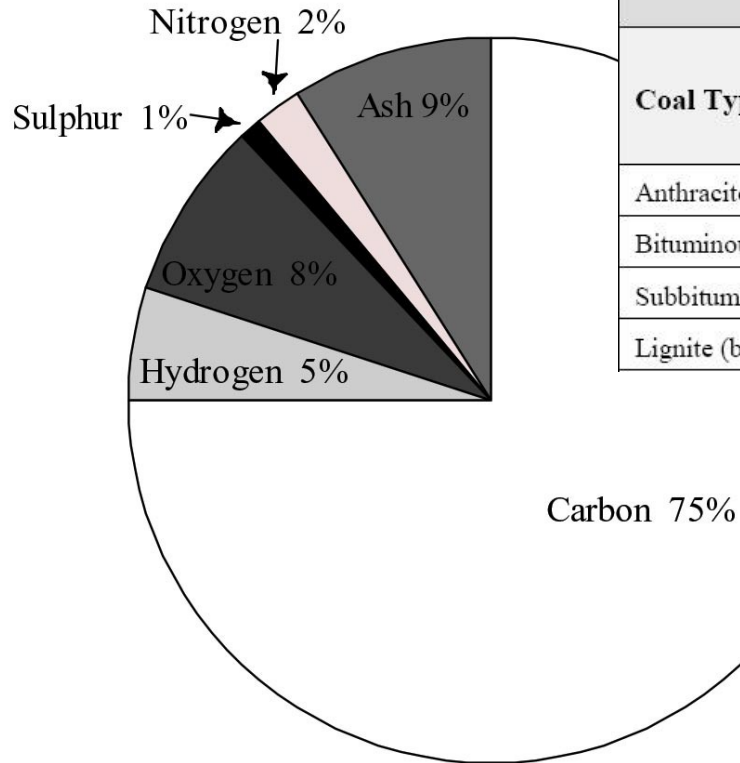


* One-month lagged

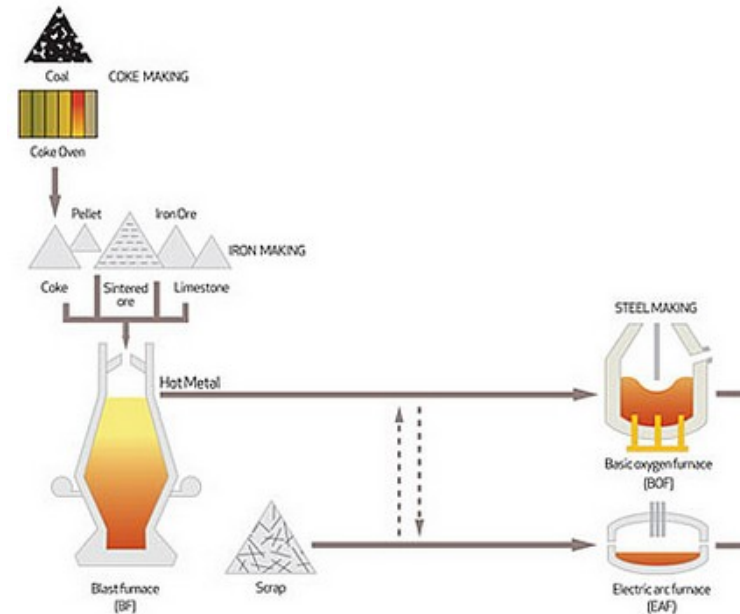
Sources: Bloomberg; RBA



Kömür

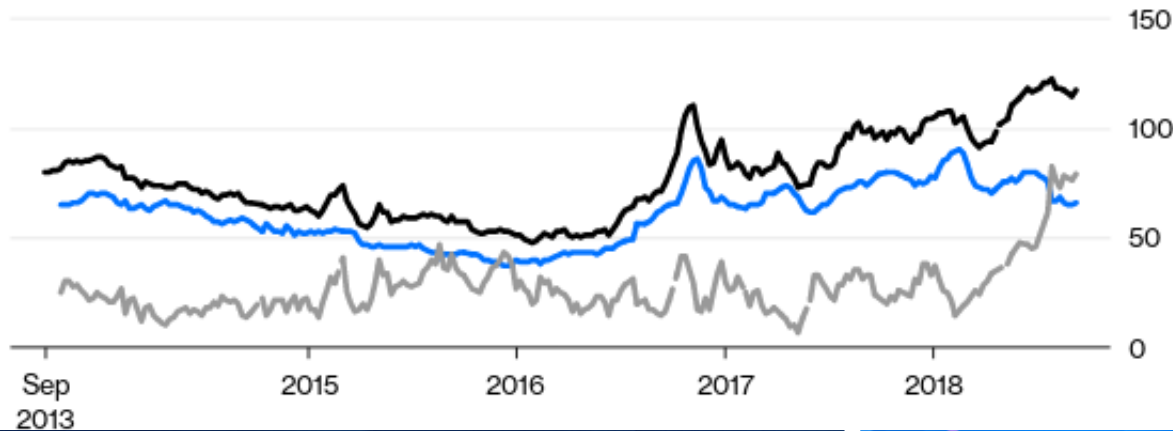


Types of Coal and Their Characteristics					
Coal Type	Percent Carbon	Heating Range Values (MMBtu/ton)	Heating Avg. (MMBtu/ton)	Moisture Content by Weight	Sulfur Content by Weight
Anthracite (hard coal)	86-97%	22 to 28	25	usually < 15%	0.6%
Bituminous (soft coal)	45-86%	21 to 30	24	usually < 20%	1.4%
Subbituminous (black lignite)	35-45%	17 to 24	18	20-30%	0.4%
Lignite (brown coal)	< 35%	9 to 17	13	as much as 45%	1.0%



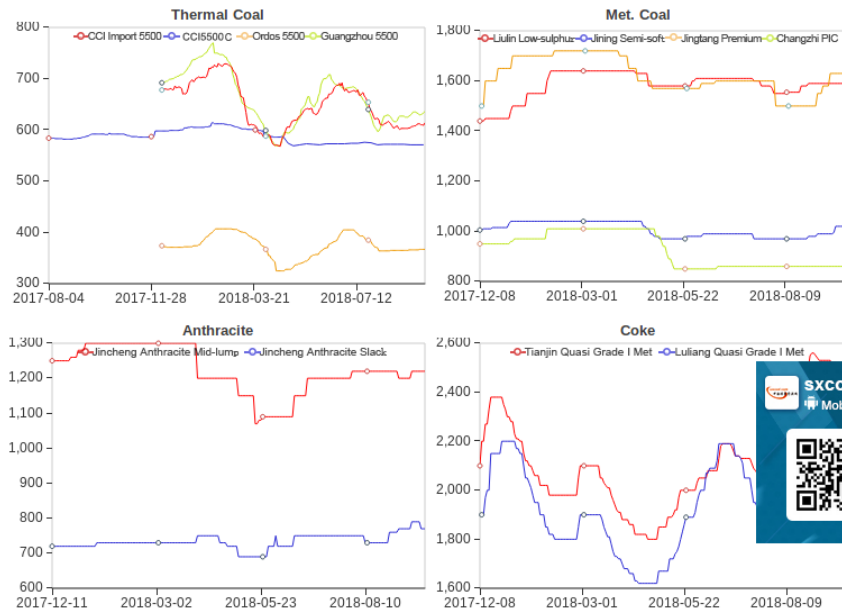
Kömür fiyatlaması

/ 5,500 kcal, \$/metric ton / 6,000 kcal, \$/metric ton
 / 6,000 kcal premium, % of 5,500 kcal price



- NW Europe CIF (6,000kc NAR) – Part of API 2
- Richards Bay FOB (6,000kc NAR) – Part of API 4
- South African FOB (5,500kc NAR) – Part of API 3
- Australian FOB (5,500kc NAR) – Part of API 5
- Newcastle FOB (6,000kc NAR) – Part of API 6
- South China CFR (5,500kc NAR) – Part of API 8
- South China CFR (4,900kc , 6,000kc NAR) – produced with Xinhua
- Qinhuangdao (domestic/export) FOB (5,000, 5,800 6,000kc)
- Indonesian FOB (6,000kc NAR) / FOB (5,500kc NAR)
- Indonesian Sub-Bit FOB 4,900kc NAR, 4,200kc/3,800kc GAR
- Indian CFR (5,500kc NAR) East & West coast – Part of API 12
- India East Coast CFR & West Coast (5,000kc / 4,200kc)
- US East Coast & US Gulf High Sulphur FOB (6,000kc)
- Bolivar Colombian FOB (6,000kc NAR) – Part of API 10

Last Week	2018-09-21				More>>
Index	RMB/t	DoD	\$US/t	DoD	Basis
CCI5500C	571.00	-	0.00	-	FOB
CCI5500 Import	609.55	-0.89	76.60	-	CFR
CCI3800 Import	374.01	-0.54	47.00	-	CFR
Yulin 5800	411.00	+1	0.00	-	Mine-mouth
Ordos 5500	367.00	-	0.00	-	Mine-mouth
Datong 5500	460.00	-	0.00	-	Mine-mouth
Guangzhou 5500	735.00	-	0.00	-	Ex-stock
Liulin Low-sulphur	1590.00	-	0.00	-	Ex-washplant
Liulin High-sulphur	1160.00	-	0.00	-	Ex-washplant
Linfen 1/3 Coking	1330.00	-	0.00	-	Ex-washplant
Changzhi Meagre Lean	1030.00	-	0.00	-	Ex-washplant
Jining Semi-soft	1020.00	-	0.00	-	Ex-washplant
Jingtang Premium	1630.00	-	0.00	-	Ex-stock
Mongolia Coking	1110.00	-	0.00	-	Ex-stock
Changzhi PCI	860.00	-	0.00	-	Ex-washplant
Jincheng Anthracite Mid-lump	1220.00	-	0.00	-	Ex-washplant
Jincheng Anthracite Slack	770.00	-20	0.00	-	Ex-washplant
Tianjin Quasi Grade I Met	2450.00	-20	0.00	-	FOB
Luliang Quasi Grade I Met	2250.00	-50	0.00	-	Ex-washplant

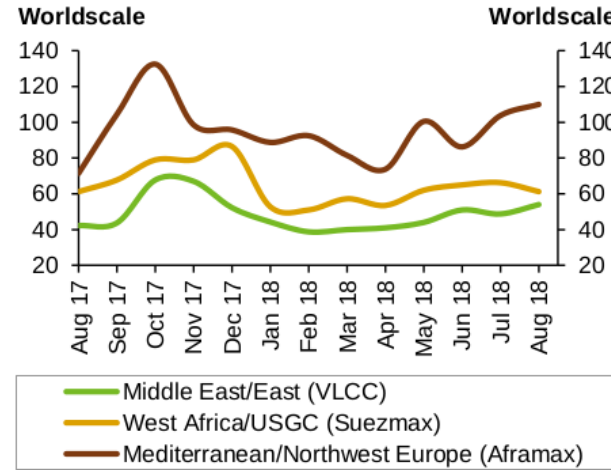


West Coast FOB (6,000kc NAR) East Coast (6,700kc)
 castle Thermal Coal Export) Index

Taşıma

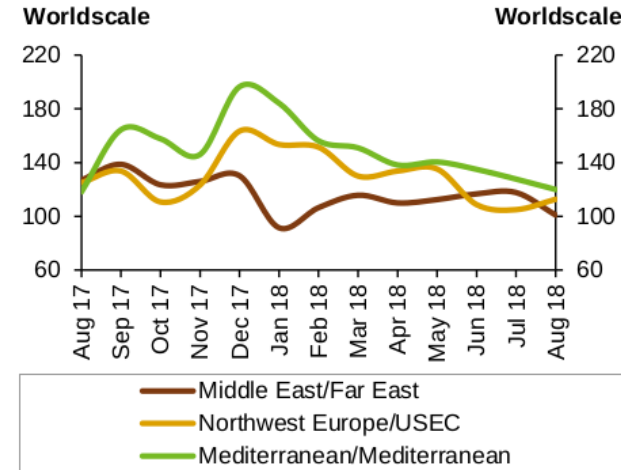
- FOB: gemiye yüklerim gerisine karışmam
- CIF: Kapiya teslim masraflar dahil
- DES: Gemide teslim (anlaşılan limana kadar)
- Baltic Dry Index

Graph 7 - 1: Crude oil spot tanker freight rates, monthly average



Sources: Argus Media and Platts.

Graph 7 - 2: Products spot tanker freight rates, monthly average



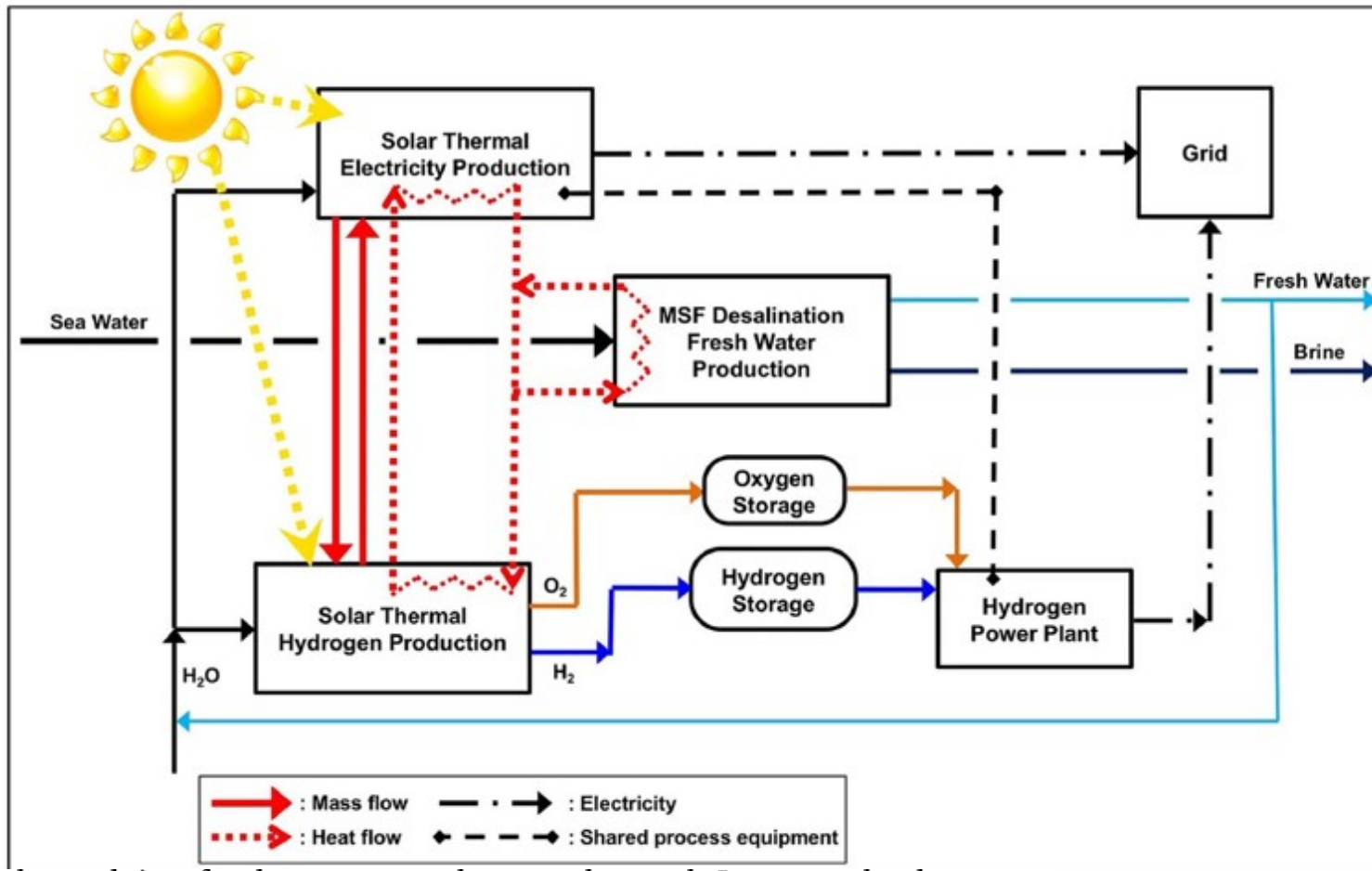
Sources: Argus Media and OPEC Secretariat.

Kaynaklarda ayırım

- Marjinal maliyete göre (Fiyatlama şekli)
 - Değişken marjinal maliyetli (Ör: CD)
 - Sıfır marjinal maliyetli (Ör: Spotify)
- Üretim sistemine göre (elektrik odaklı)
 - Yönetilebilen (tevezilenebilir)
 - Kesikli (üretim zamanı kontrolünde değil)

Güneş

- Silikon, perovskit



Toward supplying food, energy, and water demand: Integrated solar desalination process synthesis with power and hydrogen coproduction

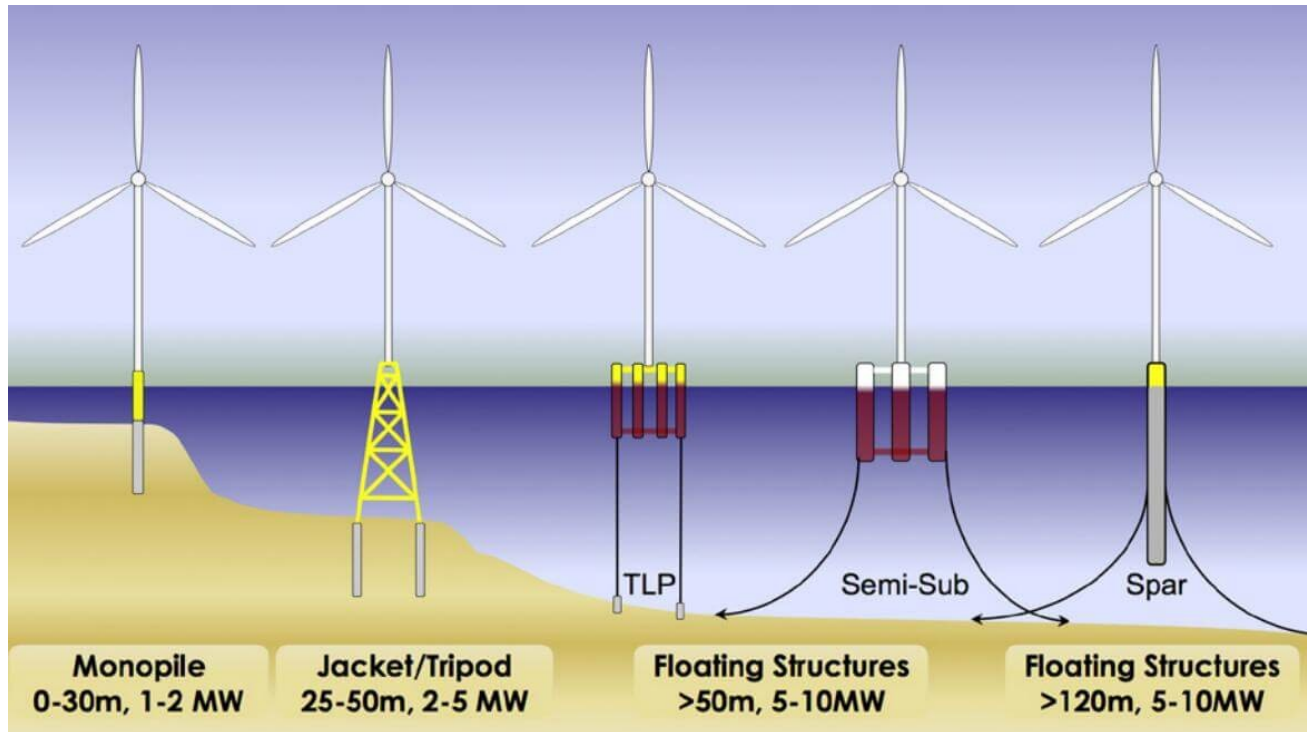
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^b MIT Energy Initiative, Massachusetts Institute of Technology, Cambridge, MA 02139, United States

Rüzgar

- Rüzgar $\approx$ süpürülen alan*yoğunluk*hız³



Hidro



Nükleer

- Füzyon
- Fisyon

The evolution of nuclear power

Early prototype reactors



- Shippingport
- Dresden, Fermi I
- Magnox

Commercial power reactors



- LWR (PWR, BWR)
- CANDU
- VVER, RBMK

Advanced LWRs



- ABWR, System 80+, AP600, EPR

Evolutionary designs offering improved economics

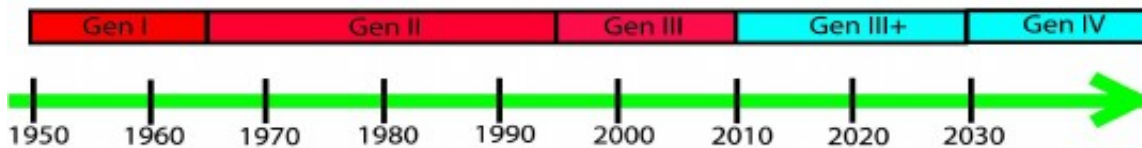
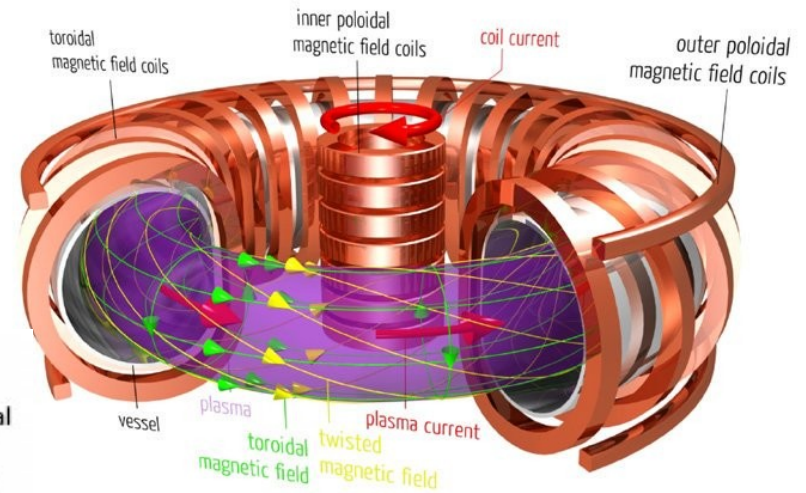


(- PBMR, SWR-1000)

- Highly economical
- Enhanced safety
- Minimize wastes
- Proliferation resistant



(- SVBR-75/100)





Sorular

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