

# A EMERGÊNCIA DOS MERCADOS LOCAIS DE ENERGIA

**Jorge Vasconcelos**

NEWES, New Energy Solutions

CONVERSE - DESCENTRALIZAÇÃO E FLEXIBILIDADE

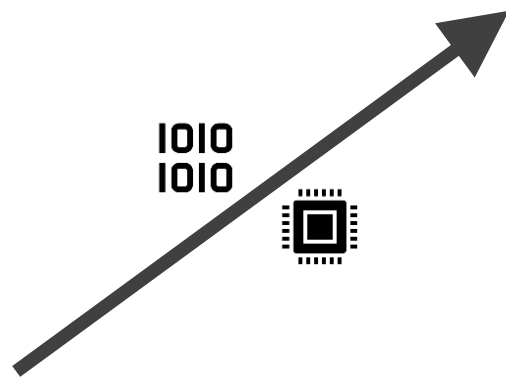
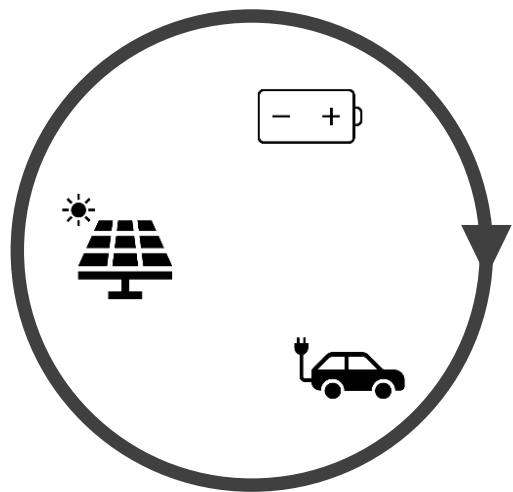
Lisboa, 13 de Abril de 2023

# A EMERGÊNCIA DOS MERCADOS LOCAIS DE ENERGIA

- O ETERNO RETORNO ?
- PRINCÍPIOS ORGANIZADORES
- MERCADOS HÁ MUITOS
- REGULAÇÃO E GOVERNANÇA

**O ETERNO  
RETORNO ?**



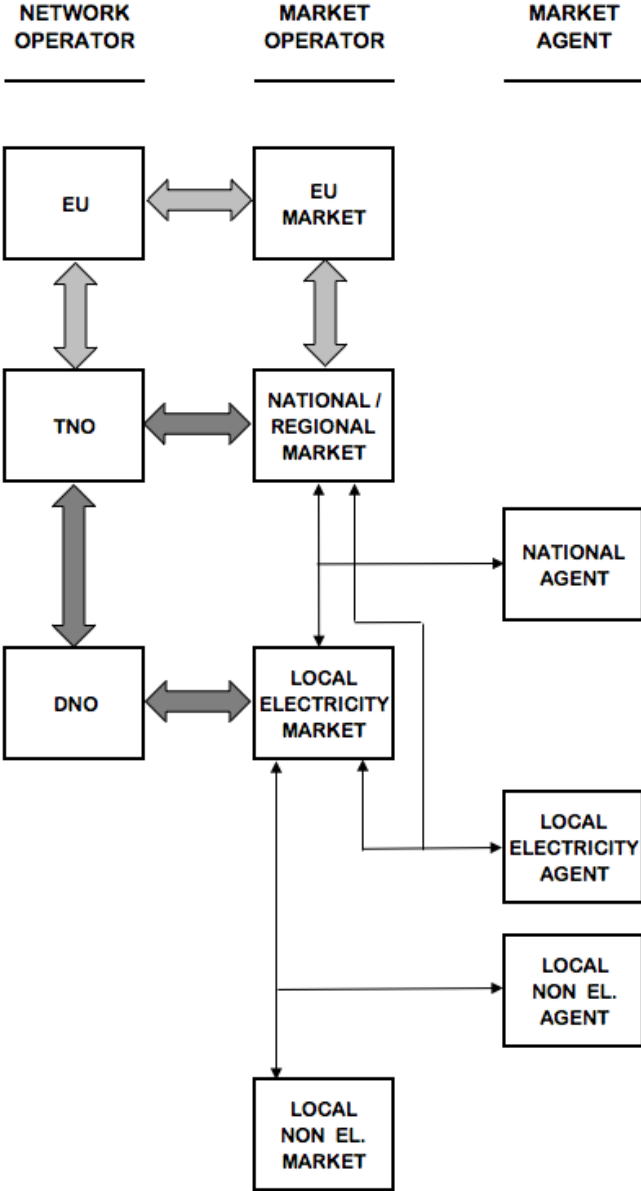


# PRINCÍPIOS ORGANIZADORES

- **SUBSIDIARIEDADE**
- **INTEGRAÇÃO SISTEMAS ENERGÉTICOS**
- **DIGITALIZAÇÃO DA ENERGIA (INOVAÇÃO)**

# SUBSIDIARIEDADE

# The new electricity functional relational map



# INTEGRAÇÃO SISTEMAS ENERGÉTICOS

“Energy system integration – the coordinated planning and operation of the energy system ‘as a whole’, across multiple energy carriers, infrastructures, and consumption sectors – is the pathway towards an effective, affordable and deep decarbonisation of the European economy in line with the Paris Agreement and the UN’s 2030 Agenda for Sustainable Development.”



Brussels, 8.7.2020  
COM(2020) 299 final

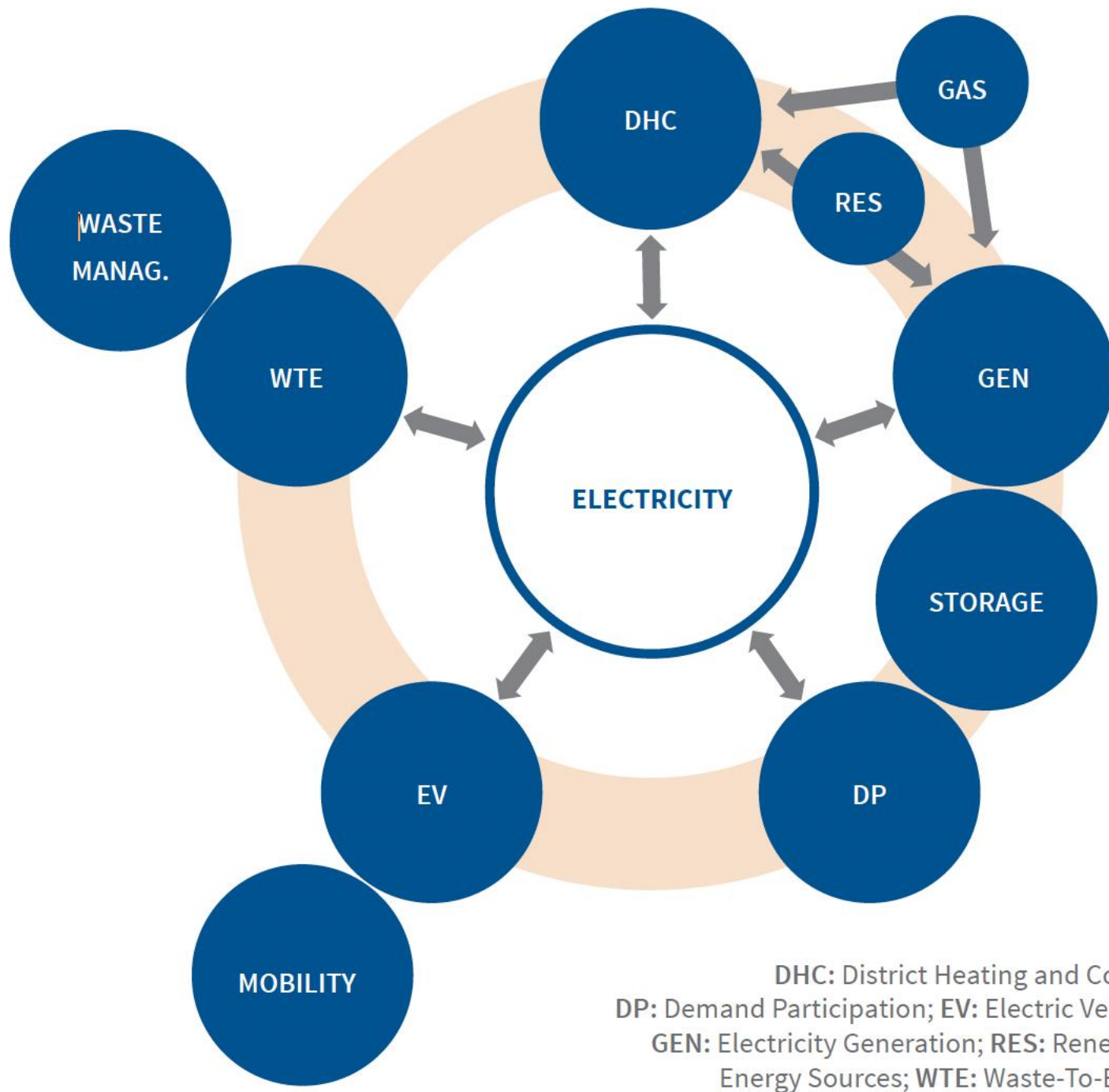
COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Powering a climate-neutral economy: An EU Strategy for Energy System Integration

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	Mtoe	
<b>Final energy consumption</b>	<b>885,76</b>	
<b>by Fuel/Product</b>		
<b>Solid fossil fuels</b>	18,96	2%
of which hard coal	13,27	1%
of which brown coal	1,43	0%
<b>Manufactured gases</b>	3,89	0%
<b>Peat and peat products</b>	0,38	0%
<b>Oil shale and oil sands</b>	0,00	0%
<b>Oil and petroleum products</b>	310,31	35%
<b>Natural gas</b>	193,93	22%
<b>Renewables and biofuels</b>	104,25	12%
Solar thermal	2,44	0%
Geothermal	0,56	0%
<b>Solid biofuels and renewable w</b>	68,88	8%
Biogases	2,73	0%
Liquid biofuels	16,87	2%
Ambient heat (from heat pump)	12,77	1%
<b>Waste, non-renewable</b>	4,99	1%
<b>Electricity</b>	205,06	23%
<b>Heat</b>	43,99	5%
<b>by Sector</b>		
<b>Industry</b>	231,21	26%
<b>Transport</b>	251,97	28%
Rail	4,72	1%
Road	238,22	27%
Domestic aviation	3,08	0%
Domestic navigation	3,65	0%
Pipeline transport	1,50	0%
Other transport	0,81	0%
<b>Residential</b>	248,24	28%
<b>Services</b>	121,38	14%
<b>Agriculture and Fishing</b>	29,34	3%
<b>Others</b>	3,63	0%

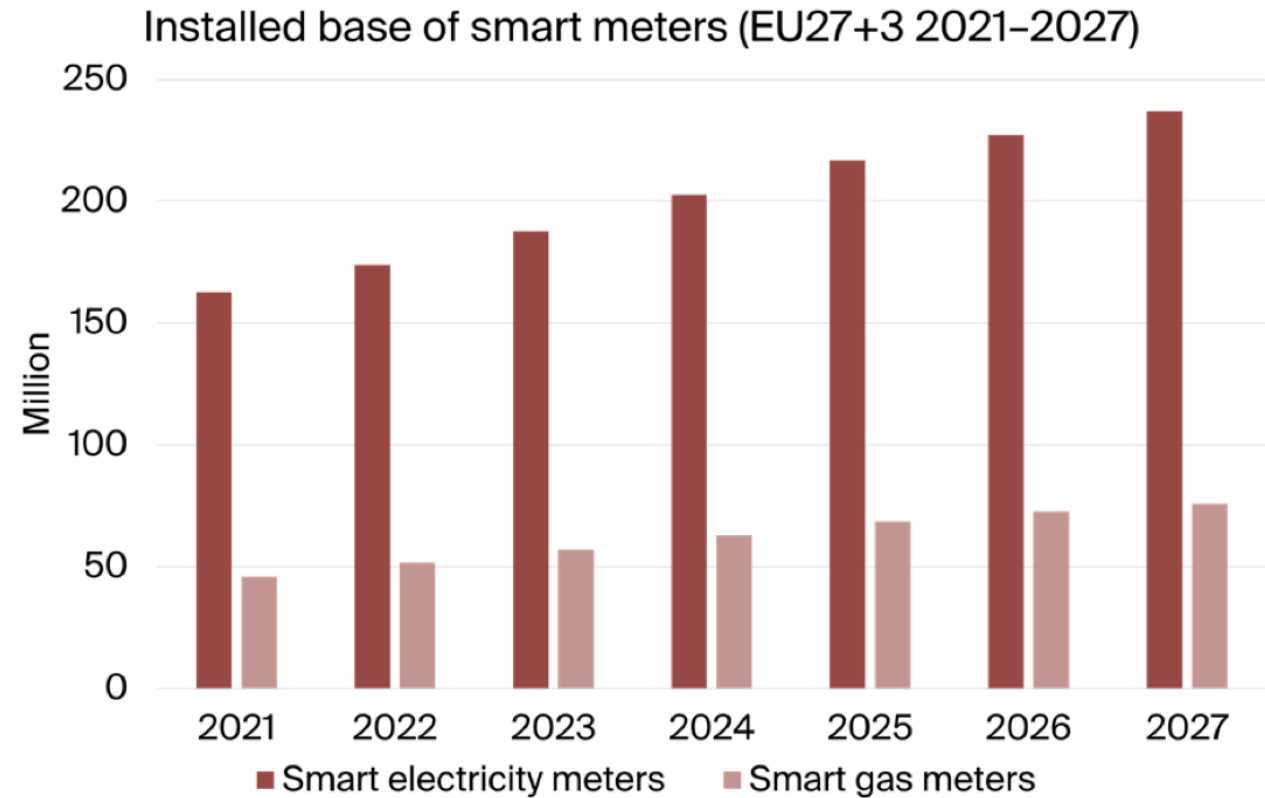


The local electricity platform is the cornerstone of energy systems integration, thus of the current energy transition. Its main function is to enable the horizontal (i.e., local level) coordination of all relevant electricity transactions. The integrative force of the local electricity platform depends on its design and intrinsic efficiency, but also upon extent and density of the space of allowed transactions, i.e., upon the number of integrable sectors. This perspective means a radical departure from the old, top-down, vertically-integrated approach, where local electricity networks were just the “last mile” of a vertical chain of supply-to-demand infrastructure.



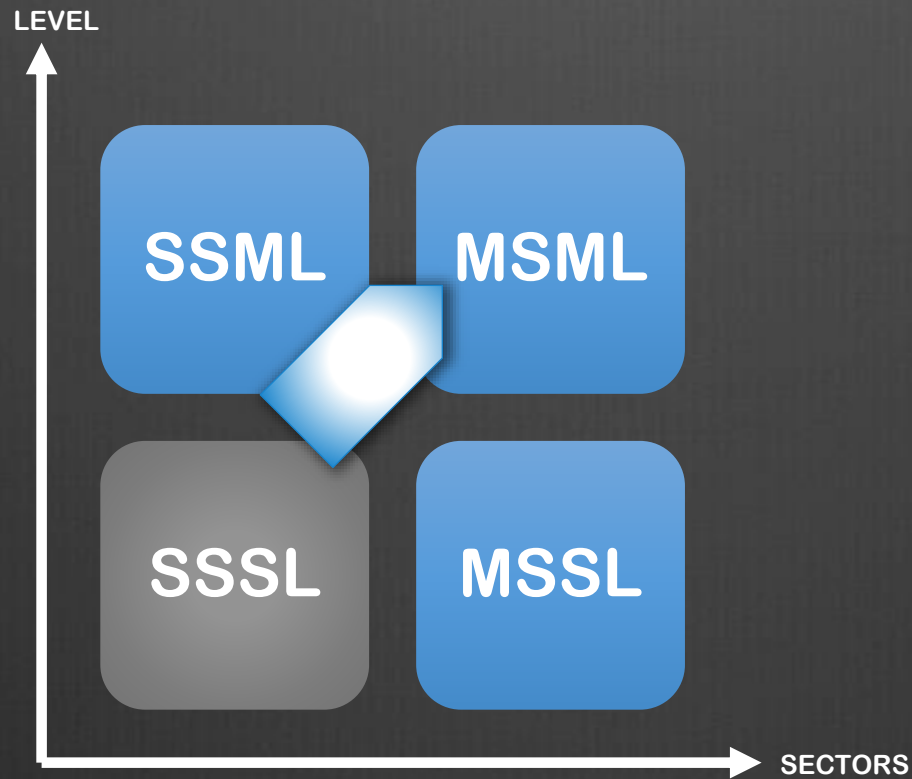
# DIGITALIZAÇÃO DA ENERGIA

berginsight.com



Over 209 million smart electricity and gas meters now deployed across Europe

# ENERGY SYSTEM ARCHITECTURE



**SSML:** Single Sector

Multiple Level

**MSML:** Multiple Sector

Multiple Level

**SSSL:** Single Sector

Single Level

**MSSL:** Multiple Sector

Single Level

MERCADOS  
HÁ MUITOS



Talking about “*the*” electricity market is a conceptual mistake and a dangerous approach to market redesign because there is no such thing.

Electricity markets are a very recent social construction, they exhibit very different features in different countries and, within any given country, they have changed substantially over the past two decades.

To pretend that the electricity market today in any given country – conceived either as an imperfect, tangible reality or as an ideal, only partially fulfilled blueprint – is the only set of rules acceptable and accepted as axiomatic and universally binding, is a mistake. In energy markets, there is no such thing as a “canon”.

When (re)thinking about energy markets it is not enough to look for ideas that are merely wrong; we need to look for troubled ideas that block progress by inspiring devotion out of proportion to their historical achievements.

**Nasdaq:**

**Created in 1971 upon request of the US regulator (Securities and Exchange Commission)**

**to solve a specific problem (improving trade of US securities not listed on exchanges)**

**through a new computerized trading system.**

**Its innovative model and lower listing fees first attracted new high-tech companies, but soon Nasdaq expanded its scope, becoming a global platform for trading of stocks, derivatives, fixed income and commodities. Today, it is the second largest stock exchange operator in the world by market capitalisation of listed companies (about three times bigger than Euronext).**

**The European electricity market was created by the European legislator**

**(facing strong opposition from industry and scepticism from consumer associations...)**

**27 years ago and it needs to be transformed in order to support, i.a.,**

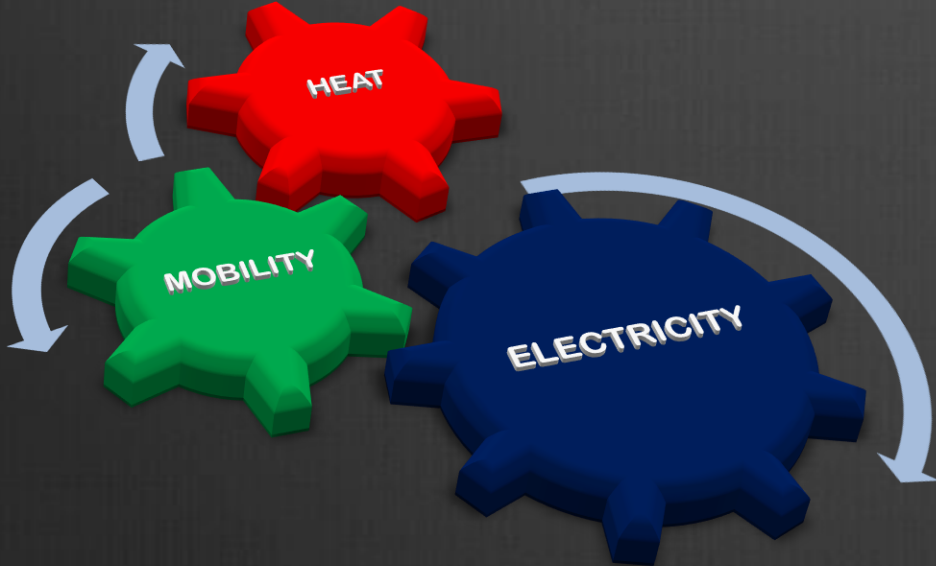
**the EU transition towards carbon neutrality and EU strategic autonomy.**



# REGULAÇÃO E GOVERNANÇA



# ENERGY TRANSITION GOVERNANCE



Horizontal coordination

Vertical coordination





1945 - 1990



1990 - 2022



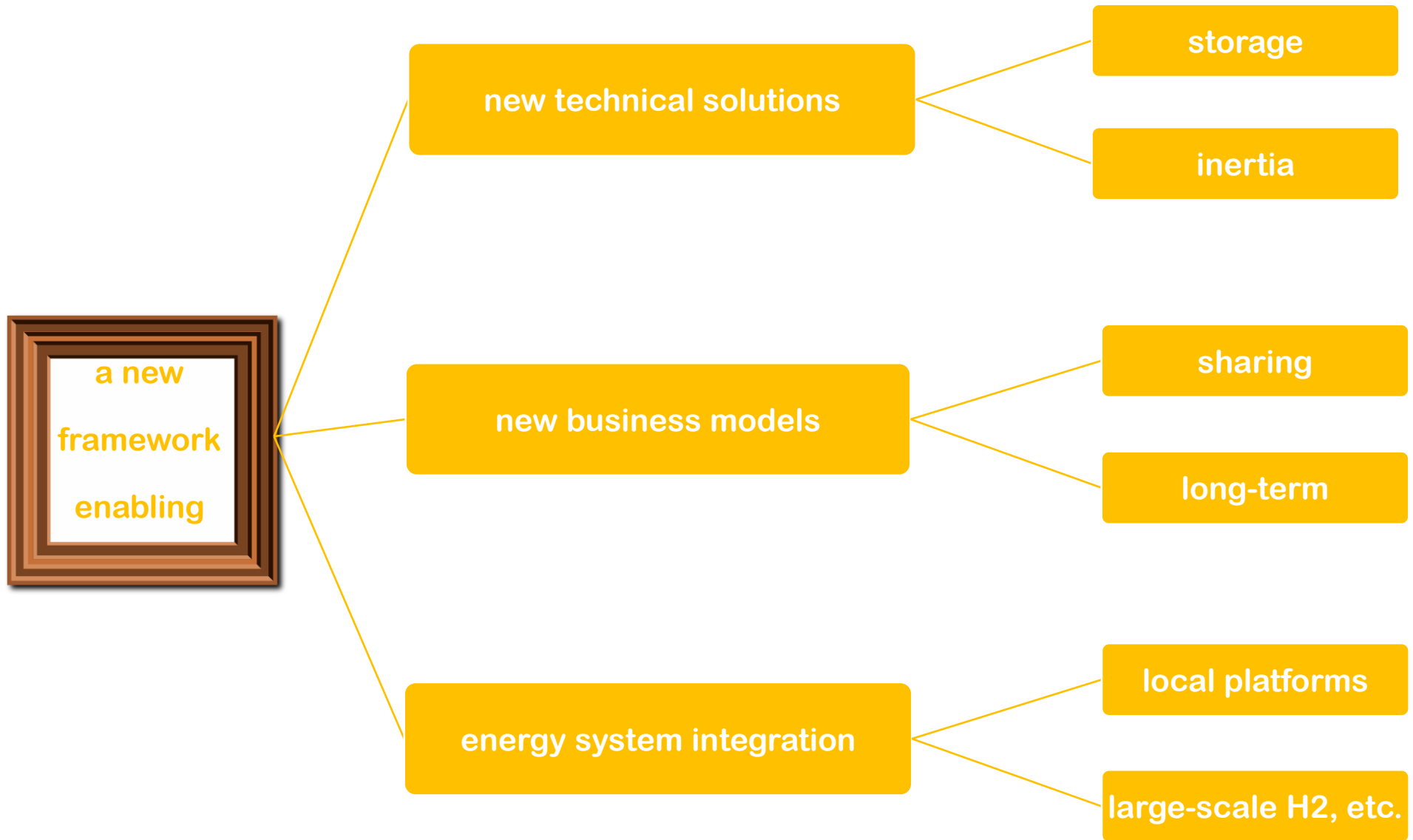
2022 - 2030



2030 - 2050



conceptual  
and legal



# Tabela periódica dos elementos

Mendeleev, 1869

## Classificação Periódica dos Elementos

GRANDEZAS E UNIDADES DO SISTEMA INTERNACIONAL DE UNIDADES (SI)																	
UNIDADES									PREFIXOS SI								
UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE	UNIDADE
Nome	Simbolo	Expressão	Definição	Simbolo	Nome	Simbolo	Expressão	Definição	Simbolo	Nome	Simbolo	Expressão	Definição	Simbolo	Nome	Simbolo	Expressão
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# ОПЫТ СИСТЕМЫ ЭЛЕМЕНТОВЪ.

ОСНОВАННОЙ НА ШЕСТЬ АТОМНОМЪ ВѢСѢ И ЗАКОНЕ СИСТЕМЪ.

	Ti = 50	Zr = 90	? = 180.		
	Y = 51	Nb = 94	Ta = 182.		
	Cr = 52	Mo = 96	W = 186.		
	Mn = 55	Rh = 104,4	Pt = 197,1		
	Fe = 56	Ru = 104,4	Ir = 198.		
	Ni = Co = 59	Pi = 106,4	O = 199.		
H = 1	Cu = 63,4	Ag = 108	Hg = 200.		
	Be = 9,4	Mg = 24	Zn = 65,4	Cd = 112	
	B = 11	Al = 27,4	? = 68	U = 116	Au = 197,7
	C = 12	Si = 28	? = 70	Sn = 118	
	N = 14	P = 31	As = 75	Sb = 122	Bi = 210,7
	O = 16	S = 32	Se = 78,4	Te = 128?	
	F = 19	Cl = 35,4	Br = 80	I = 127	
Li = 7	Na = 23	K = 39	Rb = 85,4	Cs = 133	Tl = 204.
		Ca = 40	Sr = 87,4	Ba = 137	Pb = 207.
		? = 45	Ce = 92		
		7Er = 56	La = 94		
		7Yt = 60	Di = 95		
		?In = 75,4	Th = 118?		

D. Mendeleev

