

Critical Elements of Sustainable Energy Supply in line with the “SE4ALL” initiative



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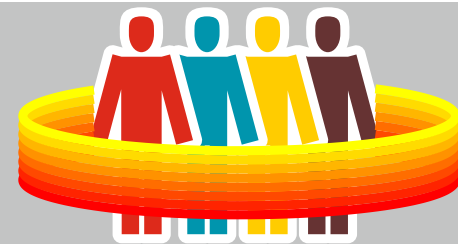
Alexandr Braginskiy
president of
SAF-Center



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Global UN Initiative «Sustainable Energy for All» SE4ALL is planning to solve three interrelated tasks to 2030:

1. Provide universal worldwide access to modern energy sources.



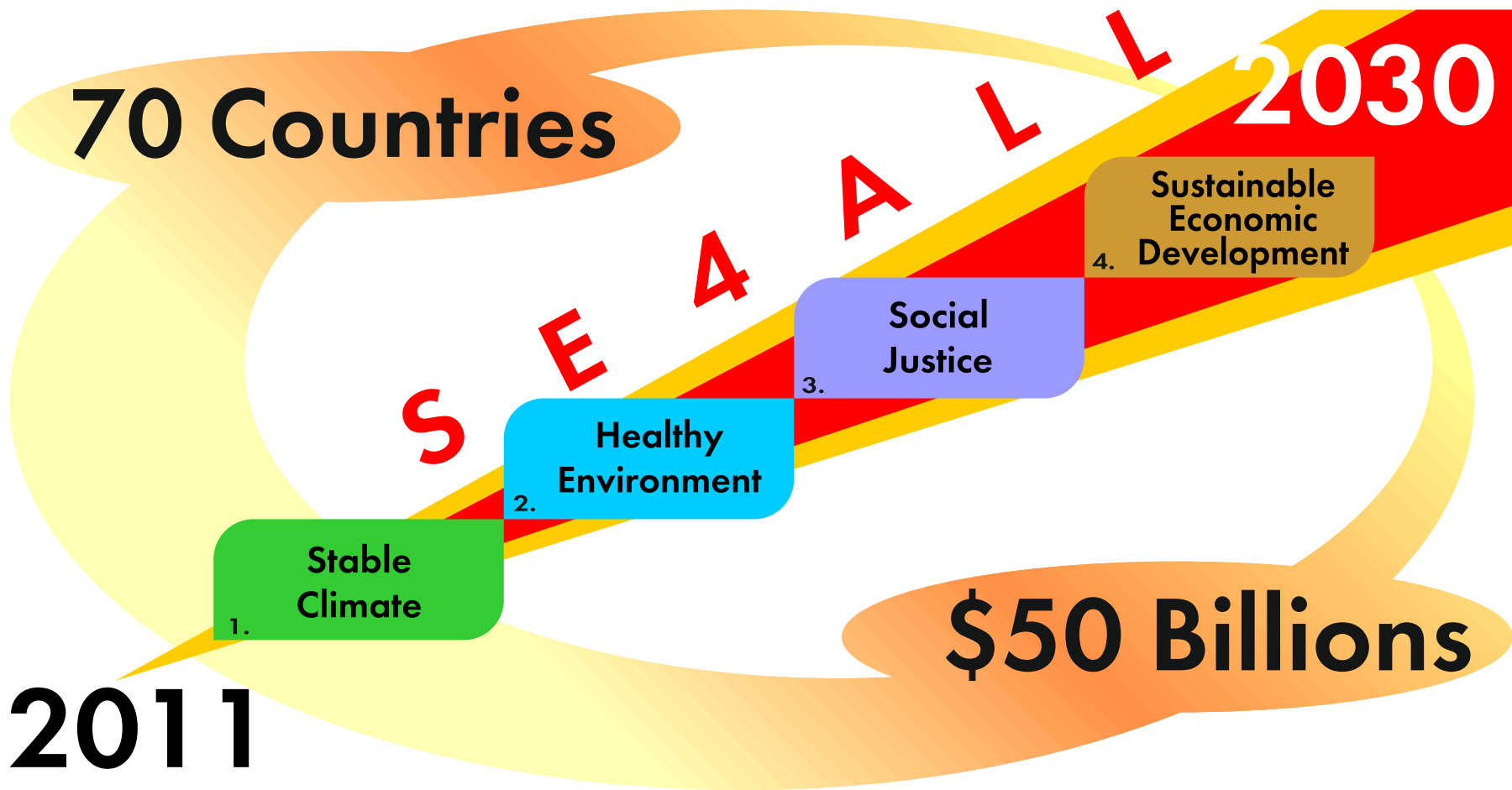
2. Double the level of energy efficiency.

x 2

3. Double the share of Renewable Energy Sources RES in the global energy balance.

x 2

Global UN Initiative SE4ALL:



The key problem of the world energy inequality. International Energy Agency IEA.

Annual report World Energy Outlook WEO-2013
confirmed the conclusions of the report WEO-2012:
Global demand for energy is growing almost twice as fast
as the overall energy consumption is growing

Energy Demand Growth

x 2

**Growth of
Power Generation**



Great Race of Power Generation and Energy Demand

$$2V_2 < V_1!!!$$

Velocity V_2 →

Velocity V_1 →



...2010 → 2012 ... → 2022 ... → 2028 → 2030 → 2032...

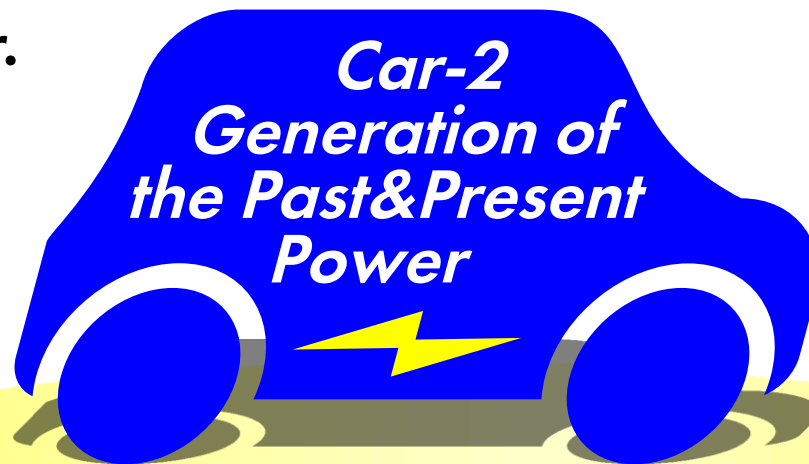
The CAR-2 of Power Generation

The Energy of the Past:

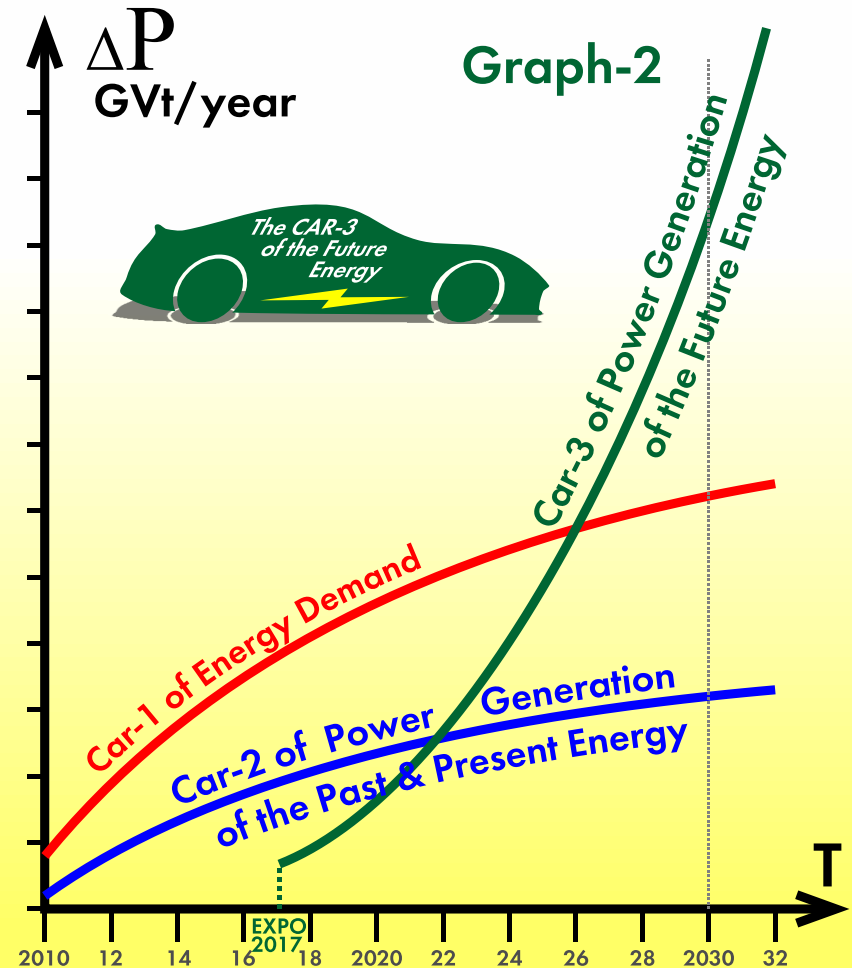
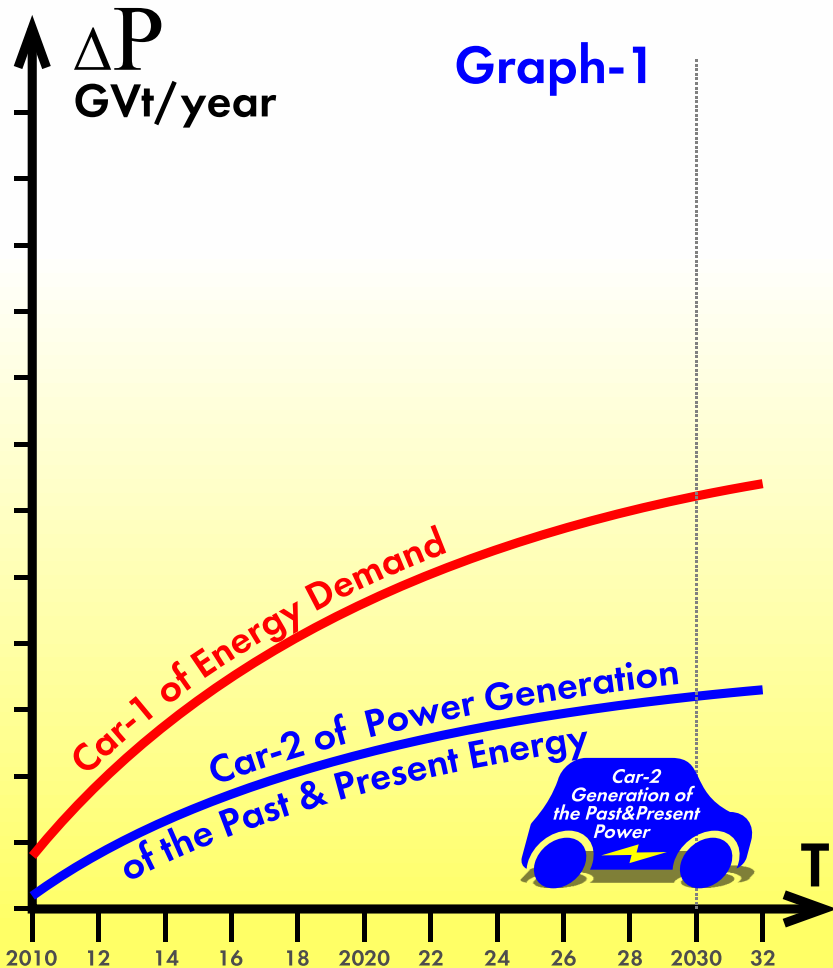
Hydrocarbons,
Electric, Coal, Hydro,
Wind, Fire, Solar.

The Energy of the Present:

Nuclear,
Electro-Chemical,
Photovoltaics,
Photosynthesis.



The CAR-3 of the Future Energy



EXPO-2017 «FUTURE ENERGY»



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Start preparing this "overtaking" we can now. In 2017, in Astana, Kazakhstan, will be a World Exhibition EXPO-2017 "Future Energy".

It should be the first showcase of the achievements of the world's Future Energy research. This preparation can lead the UN as part of it's initiative SE4ALL-2030.



FORMULA-1 OF THE FUTURE ENERGY

$$\text{Future Energy} = \text{Past Energy} + \text{Present Energy} + X$$

Where $X \neq \text{Past Energy} \neq \text{Present Energy}$.

What is equal X?

X = SAFE

Where **SAFE** is a **Sustainable Alternative Future Energy**.

SAFE - is an Alternative to all exist Alternatives

Energy efficiency of the Future Energy «SAFE».

1 Specific Energetic Capacity of **SAFE** > Nuclear **in Billion times!**

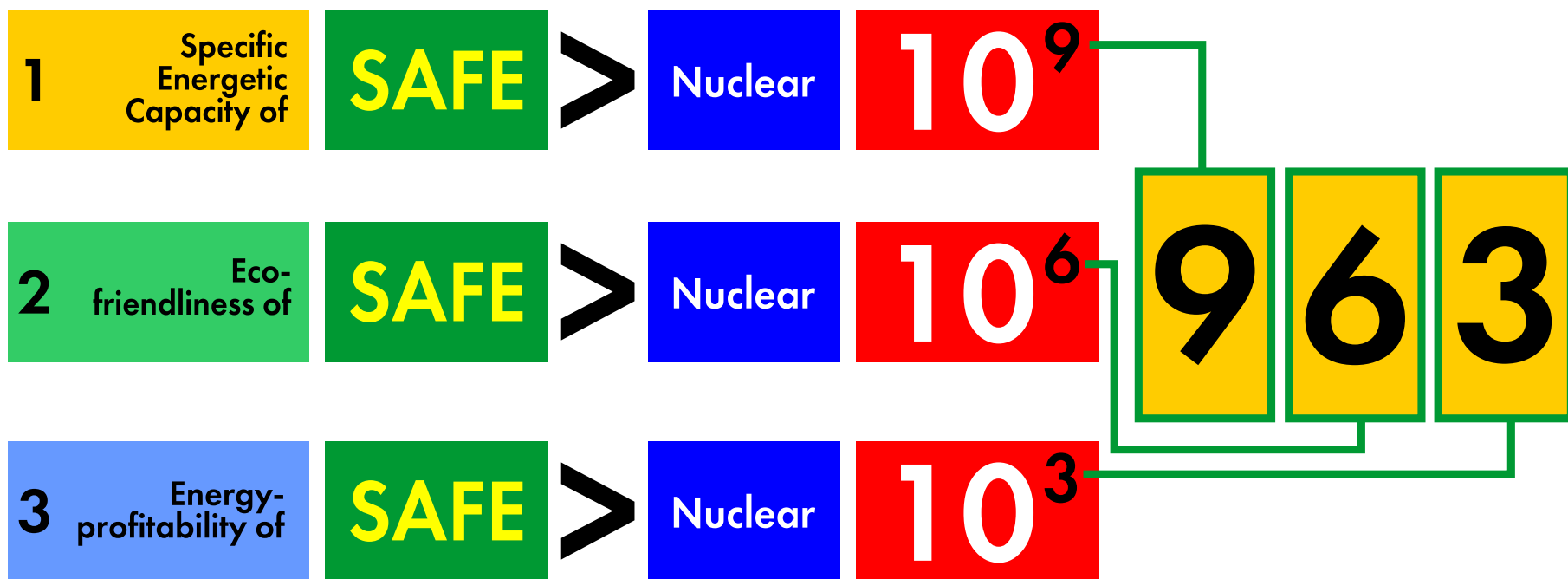
$$\text{Specific Energetic Capacity} = \frac{\text{Rate of amount of mechanical work, produced by carrier}}{\text{Mass of carrier}} \text{ Joule/kg}$$

2 Eco-friendliness of **SAFE** > Nuclear **in Million times!**

3 Energy-profitability of **SAFE** > Nuclear **in Thousand times!**

Energy-profitability **EROEI: Energy Returned On Energy Invested**

FORMULA-2 of the Future Energy «SAFE»

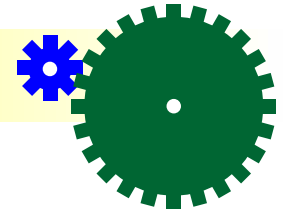


Parameters of the Energy-Reactor «SAFE-9.6.3.»

1. **Size** – as a mobile phone.



2. **Capacity** – as a thousand nuclear reactors.



3. **Eco-friendliness** – in a million times higher, then a Nuclear Power Plant.



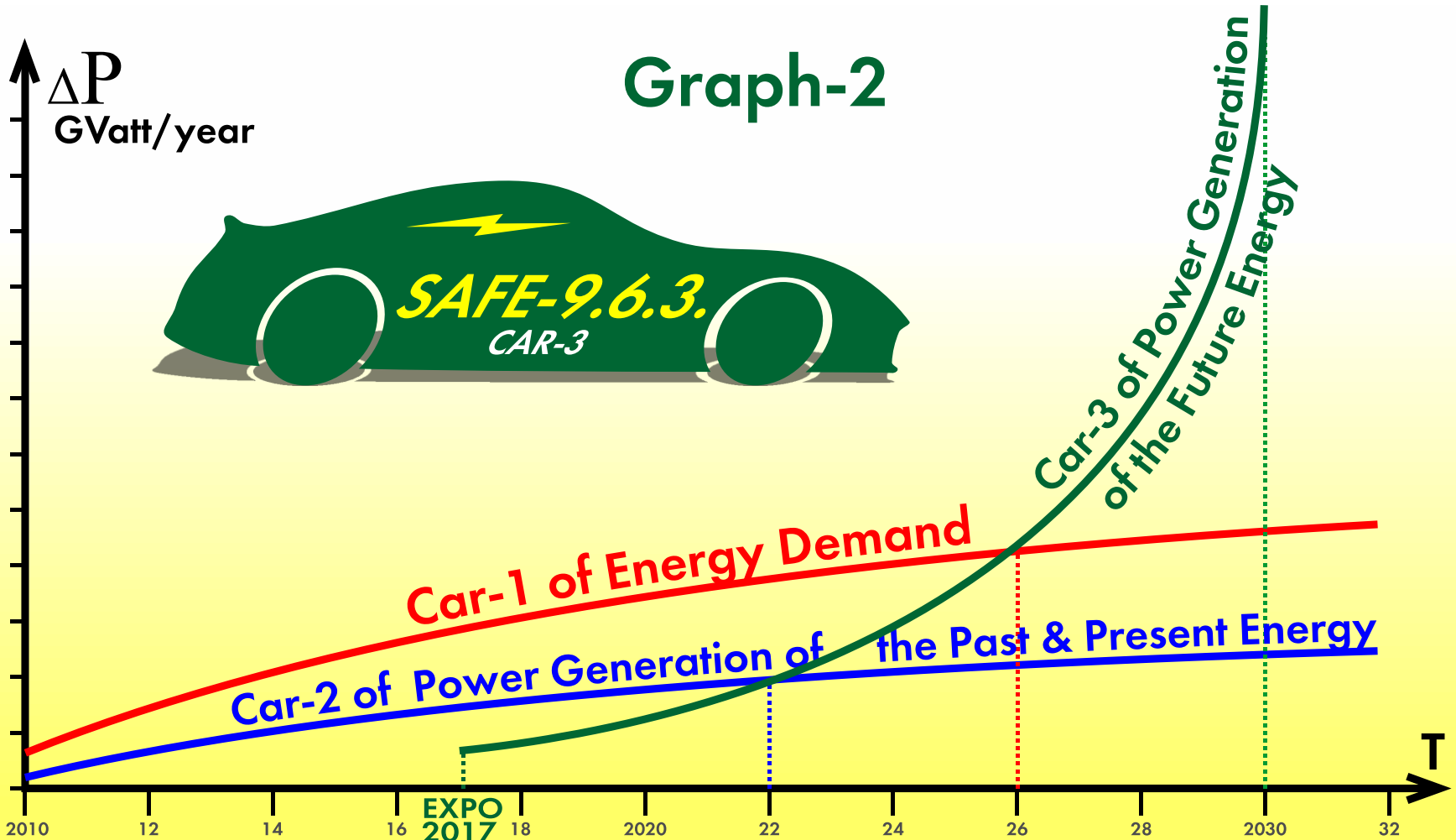
4. **Profitability** – in a thousand times higher, then a Nuclear Power Plant.

5. **Renewability** – inexhaustible and infinite Future Energy.



The Most Critical Element of the "SE4ALL" Initiative:
 When and How the Power Generation will overtake the Energy Demand?

Graph-2



The classic search scheme «CERN→LHC→Boson»

PAST	PRESENT Targets	FUTURE
MASS	ENERGY	DEVELOPMENT

CERN	"CERN" -2.0	Collaborative Energy Research Network
LHC	"LHC" -2.0	Large Human's Collector (Collaborator)
Higgs-boson	SAFE-«boson»-9.6.3.	Future Energy SAFE-9.6.3.

The Roadmap-2030: a Great Overtaking by SAFE-9.6.3.

Stage-1: CERN-2.0	STEP-1. Development of Terms of Reference (TOR) for the CERN-2.0	2013
	STEP-2. Development Feasibility Study (FS) for the CERN-2.0	2014
	STEP-3. The start of the Project CERN-2.0	2014
	STEP-4. First results of the Project CERN-2.0	2015
Stage-2: LHC-2.0	STEP-5. Development of TOR for the LHC-2.0	2014
	STEP-6. Development FS for the LHC -2.0	2014
	STEP-7. The start of the Project LHC -2.0	2015
	STEP-8. First results of the Project LHC -2.0	2016
Stage-3: SAFE-9.6.3.	STEP-9. Development of TOR for the SAFE-9.6.3.	2015
	STEP-10. Development FS for the SAFE-9.6.3.	2015
	STEP-11. The start of the Project SAFE-9.6.3.	2016 - 2021
	STEP-12. First results of the Project SAFE-9.6.3. Distribution of SAFE-9.6.3 by a worldwide network CERN-2.0.	2022 - 2030