



**COP 25**  
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# Climate Change Urgency: Energy future as seen by GISOC

**Global Initiative to Save Our Climate**  
An international collaboration from  
Scientists and Engineers

# Need to take into account many SDGs, the SR 1.5 and SR 2°C...



# ...and numerous scenarios...But:

Most of the solutions rely on :

- a reduction of the energy consumption, which GISOC challenges based on the needs of large developing countries,

- a vast availability of natural resources such as rare earths or metals (nickel, silver,...), which GISOC believes to be often unsustainable,

- a high share of intermittent energy sources,

- a high reliance on technologies which are neither currently nor in a foreseeable future available, such as DACCS (Direct Air Capture with Carbon Storage)

# GISOC Reviews...

The following items :

- Solar energy with or without thin layers and with or without recycling, Wind energy, Bio energy,
- Hydraulic power, Nuclear power with or without reprocessing and Gen-IV reactors (fast breeders),
- Batteries needed to smooth the intermittence of solar and wind energies,
- Hydrogen production, Carbon capture (DACCS), Bio Energy Carbon Capture and Storage (BECCS),
- Electric vehicles, Bio-diesel.

# ... and establishes the Element Limitation Factor as the ratio between consumption and resources till 2050

## Limitation factors per element shortage by 2050

Selected energy sources and GHG reduction items	Element limitation	Element Limitation Factor
Solar energy with or without thin layers and with or without recycling	Metals	> 4
Wind power	Rare earths	2 - 3
Bio energy	Biodiversity	< 1
Hydraulic power	Locations	10
Nuclear power without reprocessing and Gen-IV reactors (fast breeders)	Uranium	2
Nuclear power with reprocessing and Gen-IV reactors	None	< 1
Batteries to cope for the intermittence of solar and wind energies	Lithium and Rare Earths	> 20
Hydrogen production	Efficiency	1 - 10
Carbon capture as a mean to curb the evolution of the GHG concentration	Volume and Location	> 10
Bio Energy Carbon Capture and Storage (BECCS)	Locations	1
Electric vehicles with permanent magnets	Rare earths	> 10
Electric vehicles without permanent magnets	None	< 1
Bio-diesel	Food share	> 2

# GISOC's Conclusion

**ONLY** the development of nuclear energy in conjunction with reprocessing and GEN IV reactors, in association with bio-energy and carbon capture and storage (BECCS), the use of electric vehicles, and, to some extent, the use of other energy production modes in remote areas has the potential to satisfy the various SDGs retained in this paper (1, 2, 6, 7, 8, 9, 12 and 13) while addressing the Climate Change urgency.

# Any questions?

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