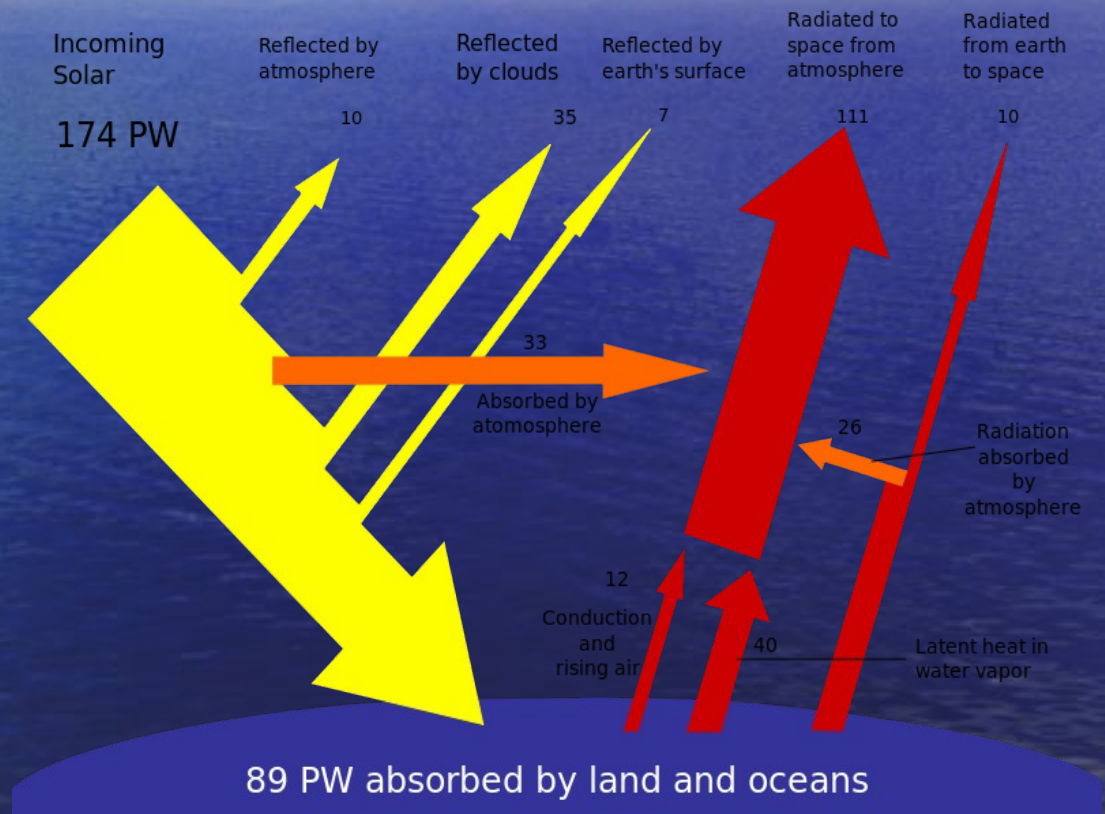
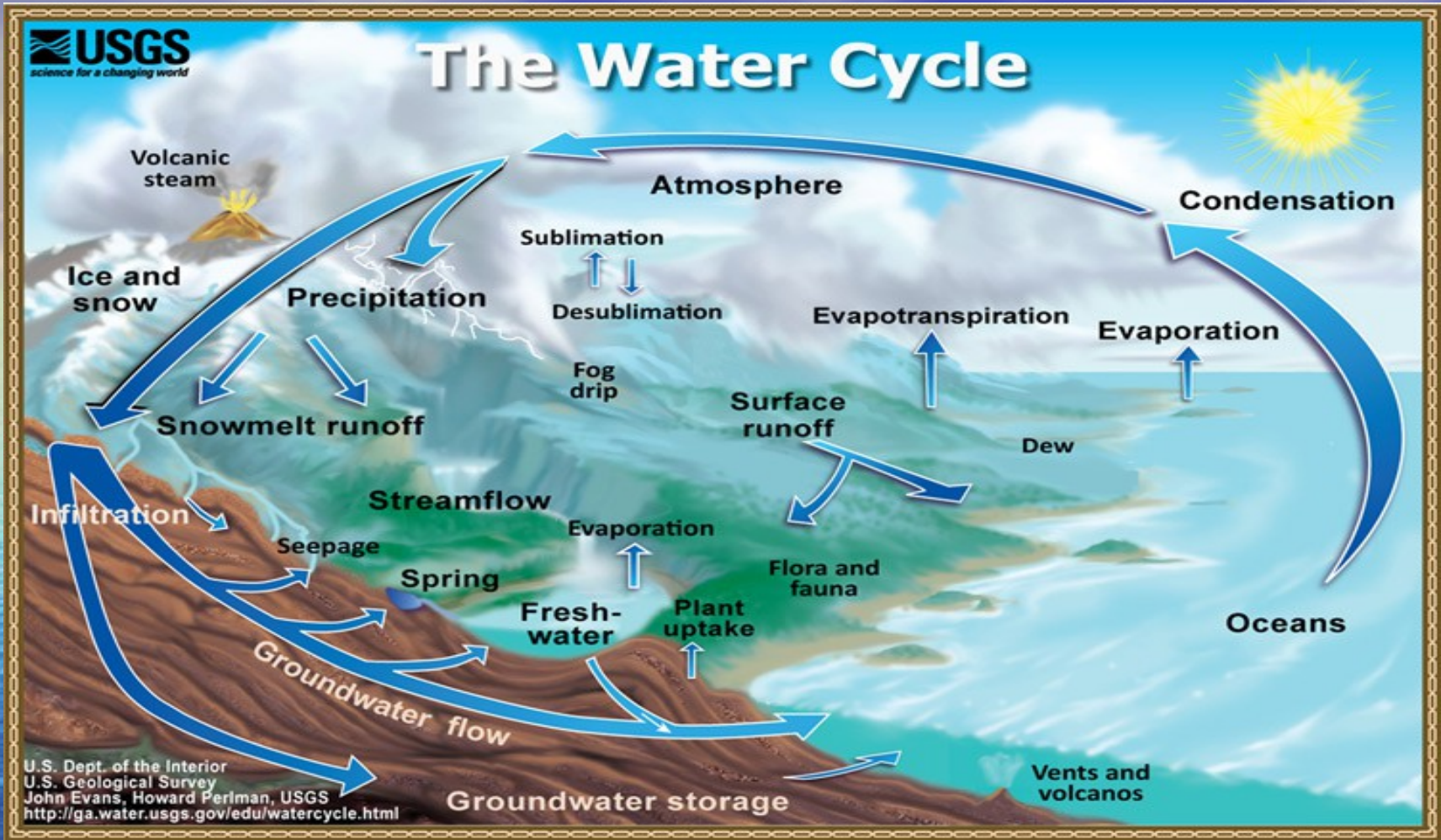


Air Hydro Power

global solution for energy-water-climate

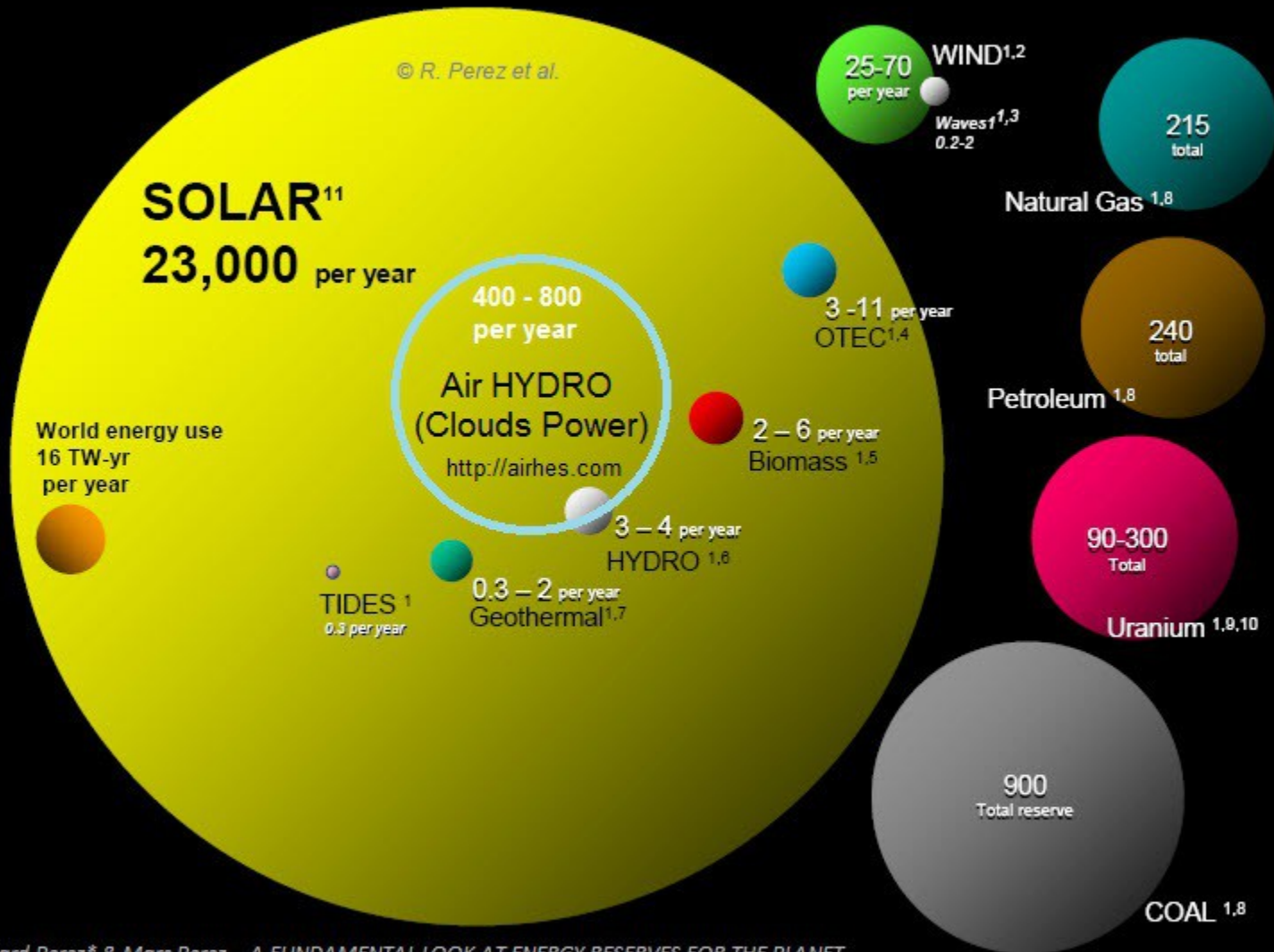
The Water Cycle is the most powerful process in Nature – about a quarter of all Sun's Energy or about a half of Sun's Energy achieving the Earth





Since the annual precipitation is about 1 m of rainfall, it matches a huge power ~ 800 TW that is:

- more than 60 times greater than all the current needs of humanity
- more than 400 times greater than all electrical power stations



source: Richard Perez* & Marc Perez - A FUNDAMENTAL LOOK AT ENERGY RESERVES FOR THE PLANET

Comparing finite and renewable planetary energy reserves (Terawatt-years).
Total recoverable reserves are shown for the finite resources.

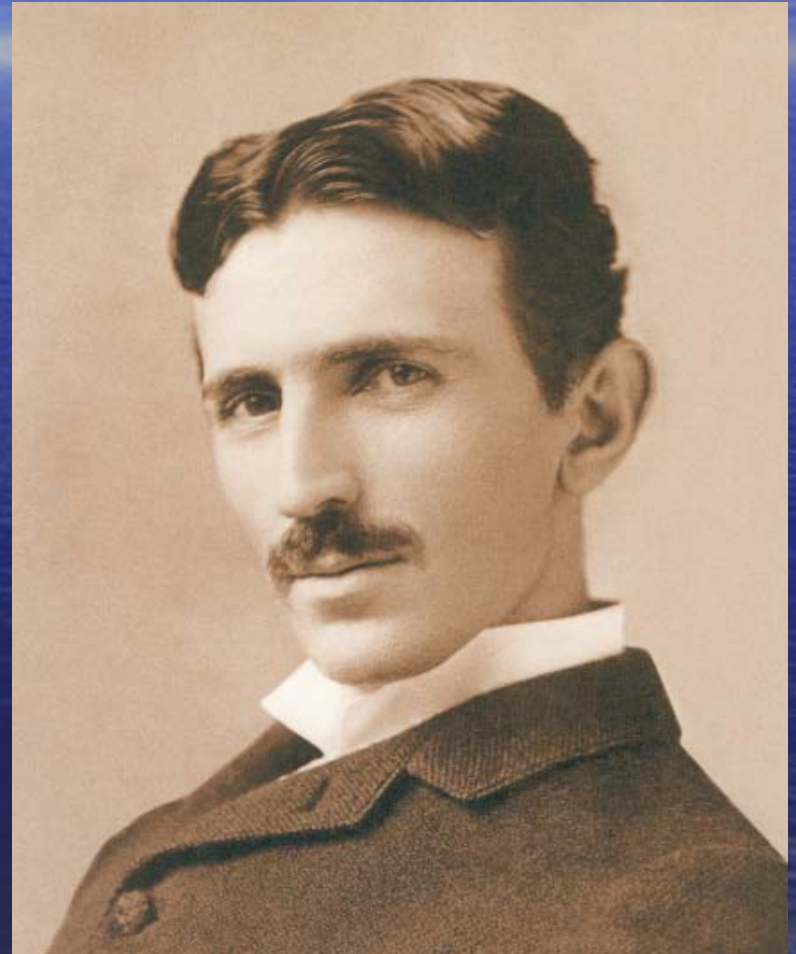
Why the usual Hydropower gives so little from this huge power?

- **By vertical:** all precipitation loses most of its potential energy on the way to the ground as it falls
- **By horizontal:** the most of precipitation falls on ocean or lowland where hydro power has no potential for using
- ✓ Therefore the flow of all rivers is 11 times less than all precipitation and all rivers power is 200 times less than power from clouds



How to avoid this power loss?

- Collect water in place where it condenses really, i.e. directly in clouds
- Use all possible hydro power head in any place of land or ocean where there are clouds
- ✓ It was suggested by Nikola Tesla yet in 1915



Air Hydro Power is sum:

- Usual Hydropower
- Barrage balloons or kites
- Fog (or here, cloud) collectors

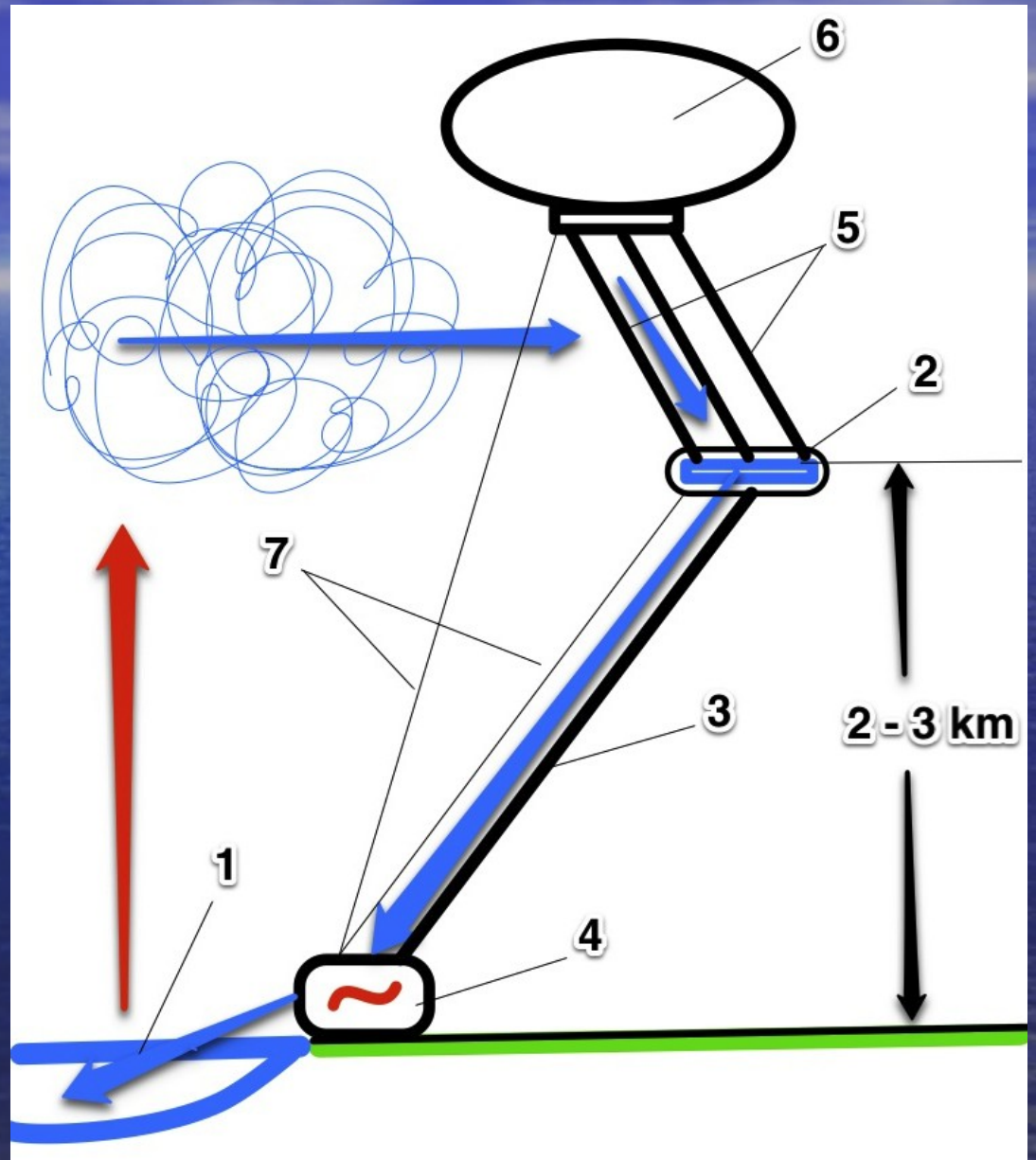


Andrew Kazantsev

Air Hydro Power

Patent RU 2500854 C1
from 17.04.12,
International Application
PCT/RU2013/000070

1. downstream
2. upstream
3. hose
4. turbo generator
5. mesh, fabric or film surfaces (cloud collectors)
6. aerostat
7. tethers



Main advantages

- Huge potential that is much more than all our needs
- Almost world-wide use where there are droplet clouds
- Accumulation as cascade pumped storage and as H₂
- Output is electricity, fresh water, and H₂ together
- Reducing the energy costs by 1-2 orders of magnitude
- Absolute ecological security from any pollution & CO₂
- Saving the climate and ecological balance of the planet
- Technological simplicity, low costs, ROI > 1000 %
- At last, it is amazing beautiful!

Main problems

- Physical - the freezing of water. Despite the fact that the clouds water remains liquid down to $-10\text{ }^{\circ}\text{C}$, on mesh of Air Hydro Power it is likely to freeze as usual at $0\text{ }^{\circ}\text{C}$. This limits the use of year-round in the northern countries, particularly in Russia.
- Operational - irregularity of clouds. Possible solutions:
 1. the alleged alternative mechanism induced condensation on the mesh (in need of experimental verification).
 2. accumulation of water on the upper reach (it can be shown that it is quite acceptable and cost 2-3 times more profitable use of traditional chemical batteries).
 3. conventional methods for renewable energy, such as by accumulation of hydrogen generation and recovery of aluminum for transport of fuel cells.
- Engineering - getting energy from a height of 2-5 km. Solved in three different ways:
 1. standard pressure hose,
 2. free-flow gravity hose (channel waterfall)
 3. cable car (reverse aerial lift).Further R&D are needed for different types of installations.

Application areas and markets

correspond to zones of intense precipitation in the climate map:
Europe, USA, Latin America, Central Africa, India, China, Japan, Indochina ...



Testing the first scientific prototype of AirHES (Seliger, Russia, 2013/07/30)

