A symposium hosted by Chilean Embassy in Japan

“Amazing Atacama”

August 1, 2012, at Tokyo Chamber of Commerce and Industry's

Part II

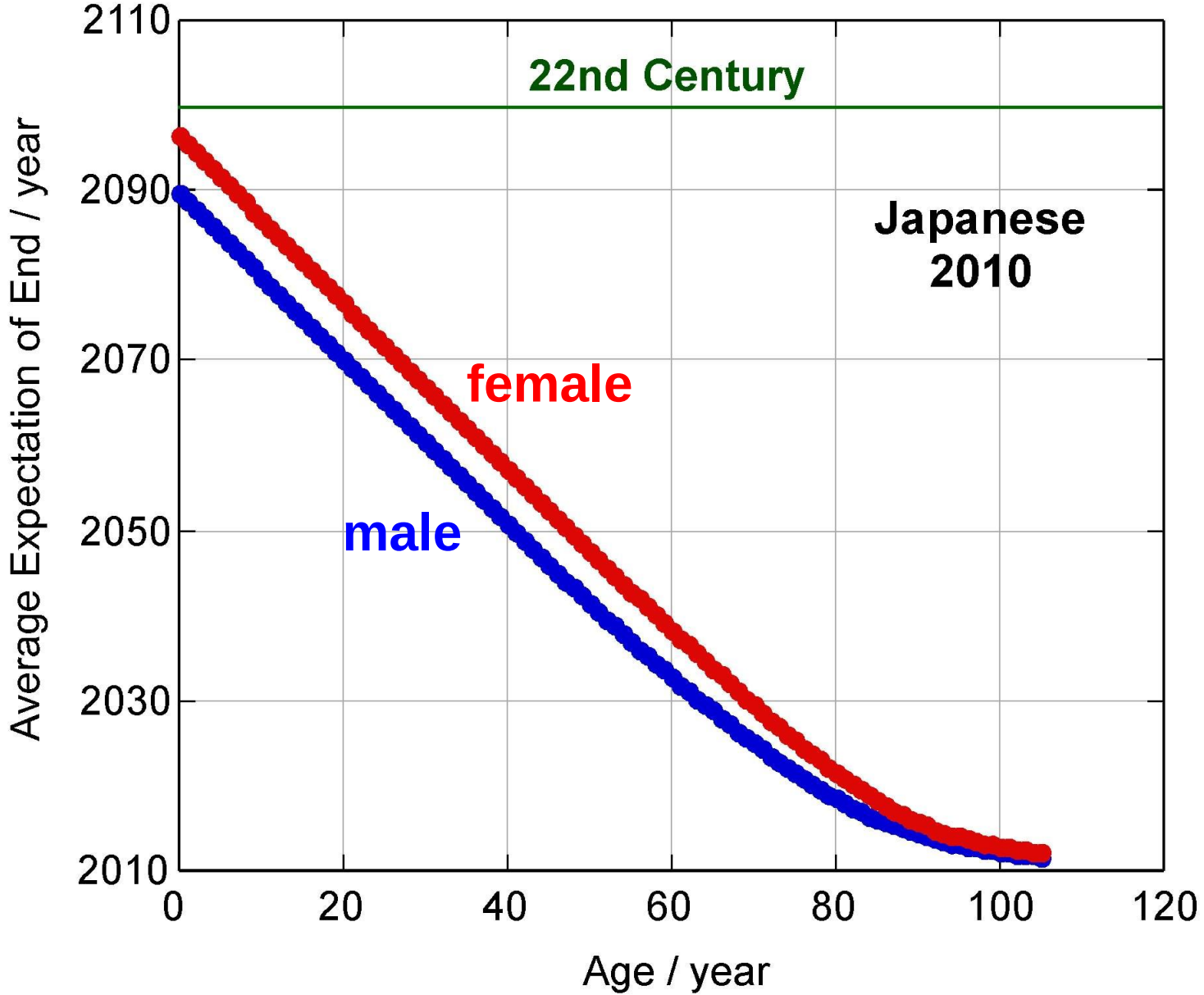
"Japanese Technology of Renewable Energy Applicable to Desert Environment"

Raising Problems

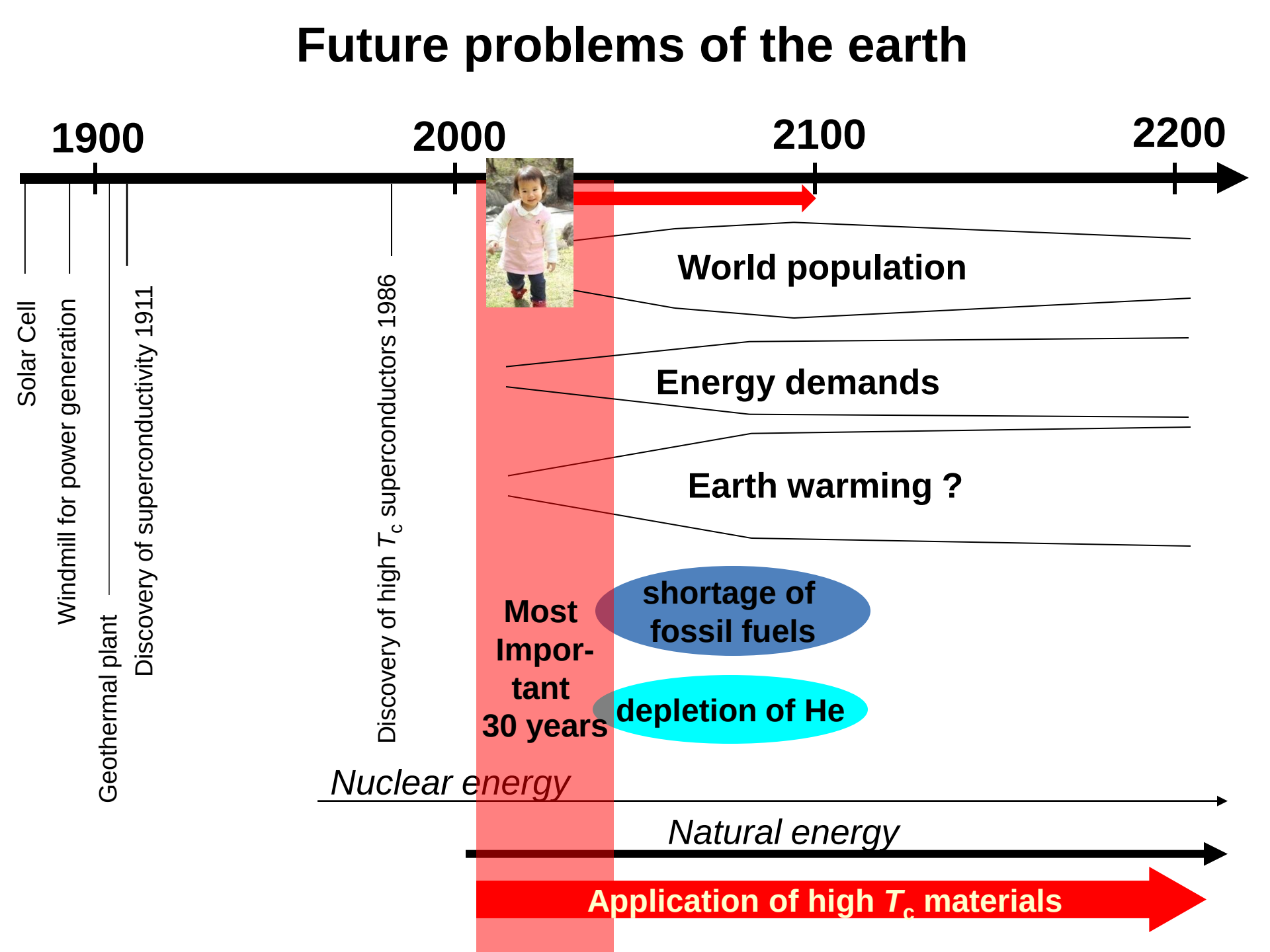
Why now Atacama?

Jun-chi Shimoyama (Univ. of Tokyo)

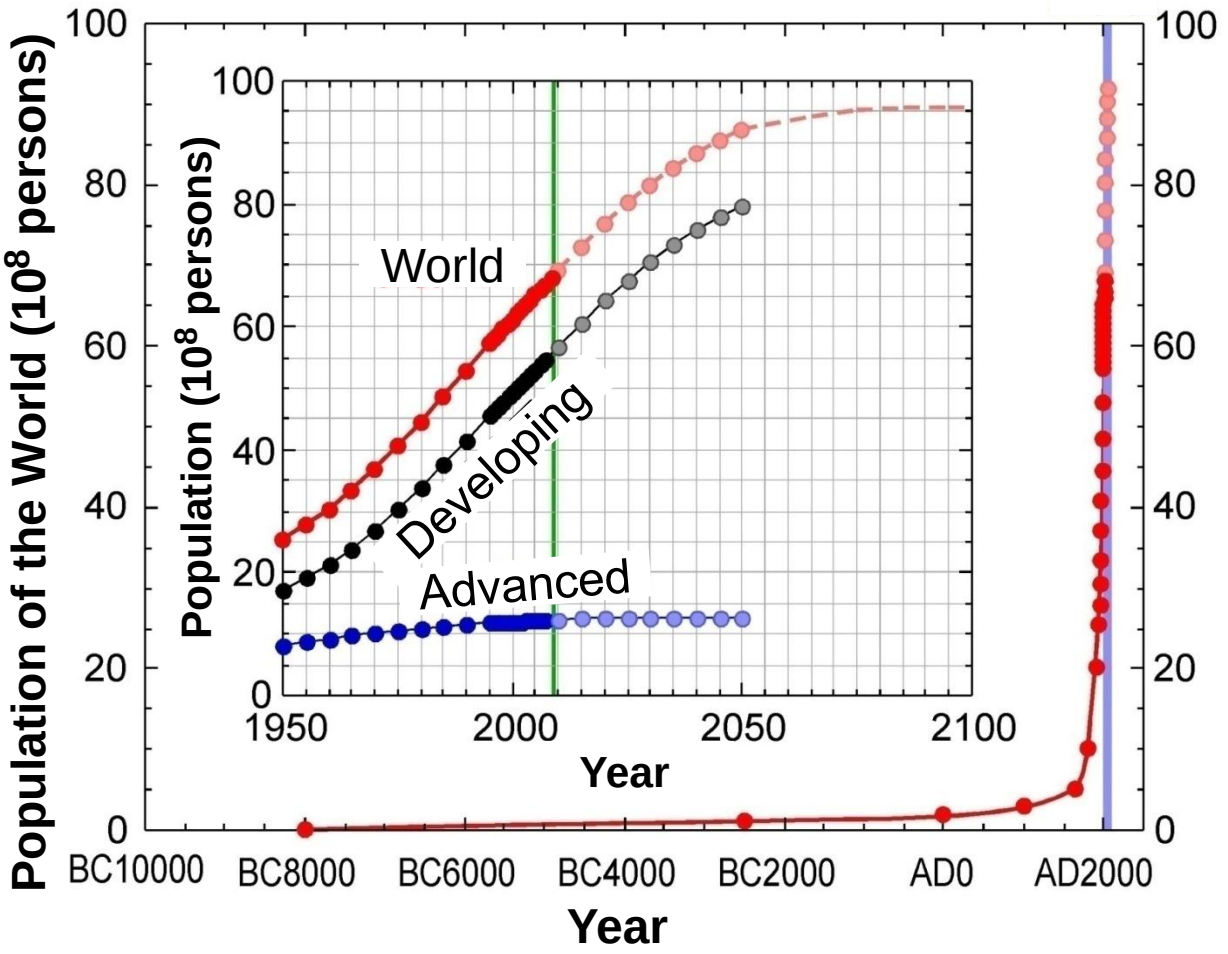
Life expectancy of us and our children



Future problems of the earth



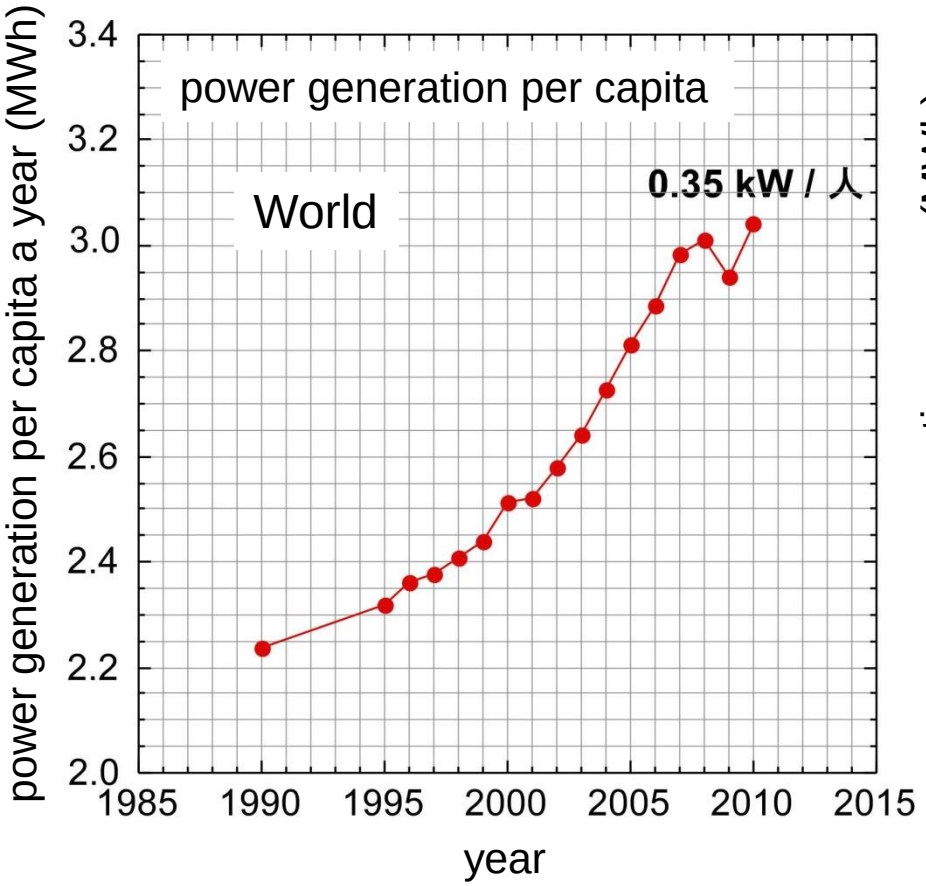
Increase in world population＝ Increase in energy users

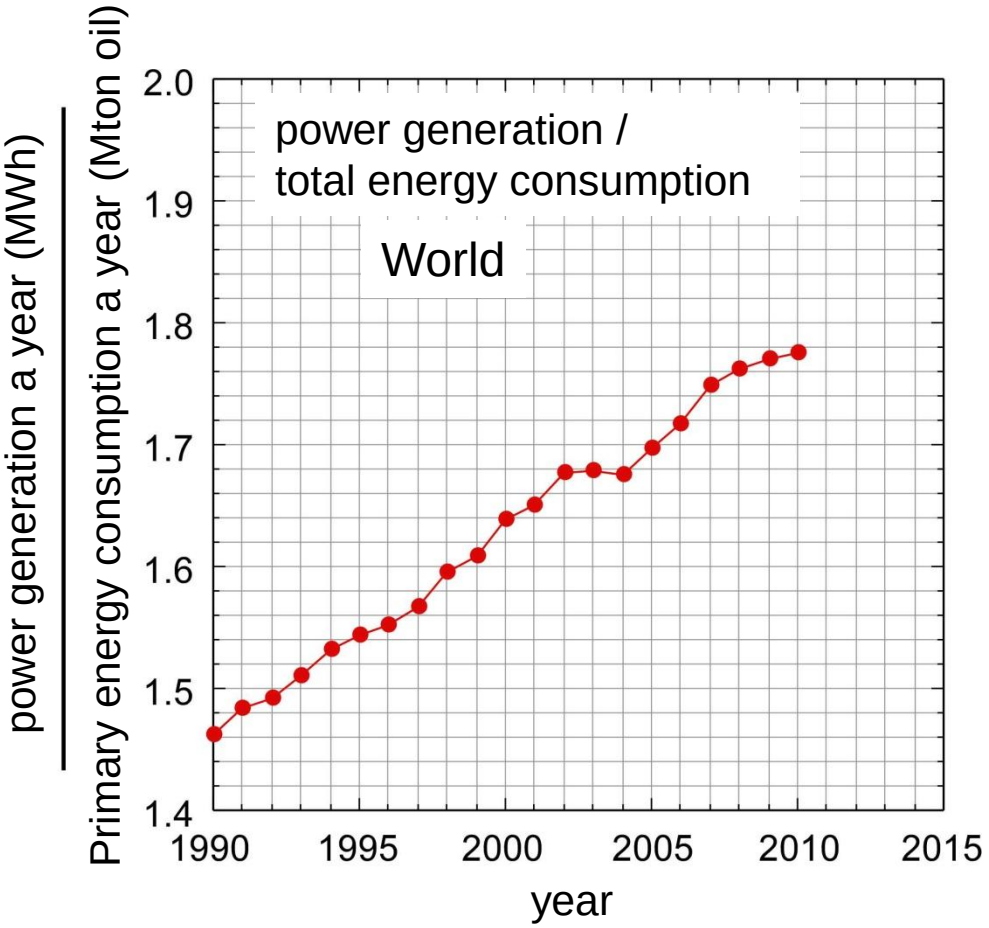


Population of advanced countries had increased for 150 years after the industrial revolution. ⇒ constant (now) ⇒ slight decrease (in future)

Increases in population of developing countries will continue until the late 21st century.

Increase in the rate of utilization of electric power



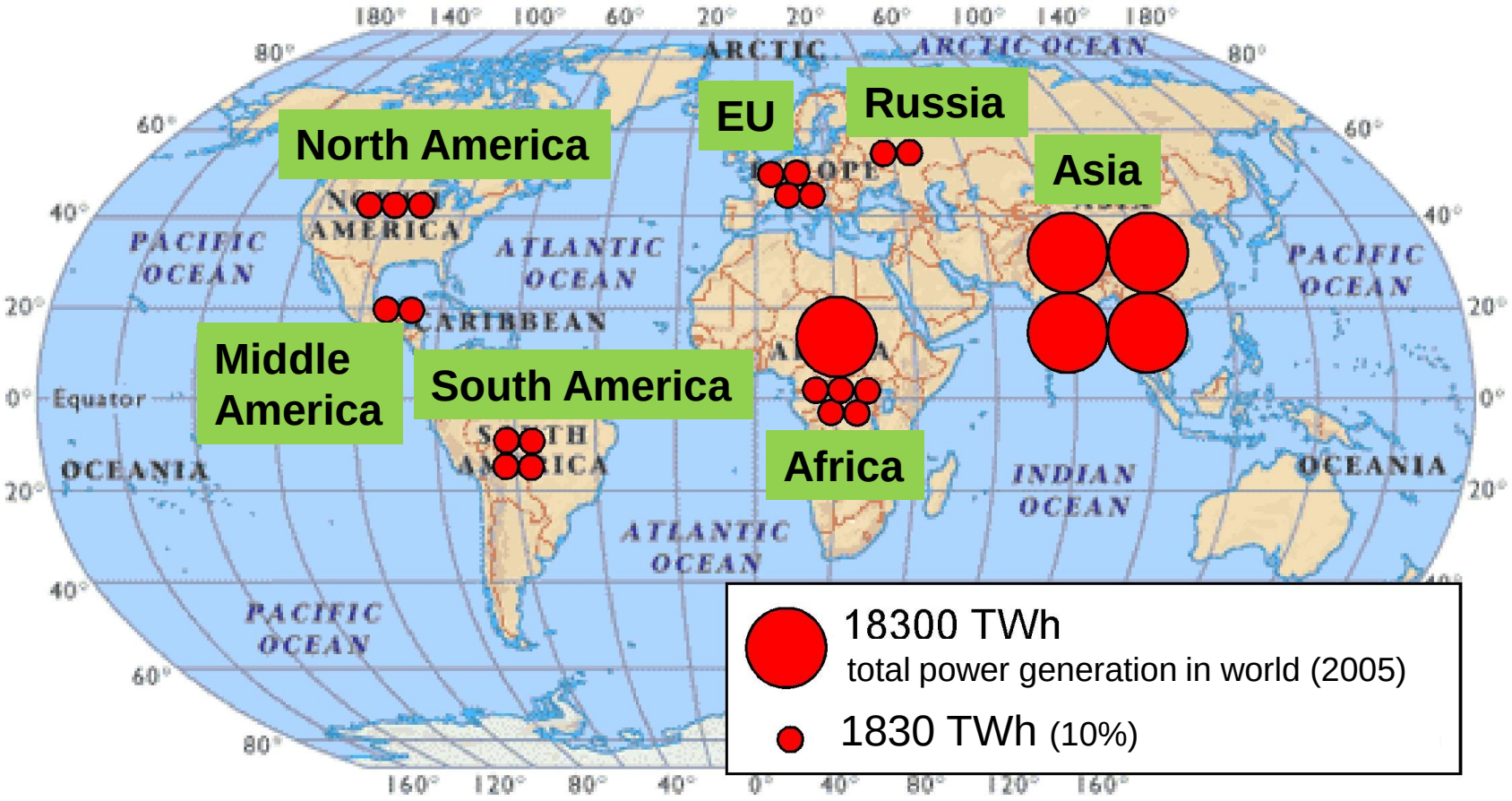


Power consumption per capita is increasing year by year.

Rate of utilization of electric power in the energy consumption is increasing.

Electricity Demands of World in Far Future

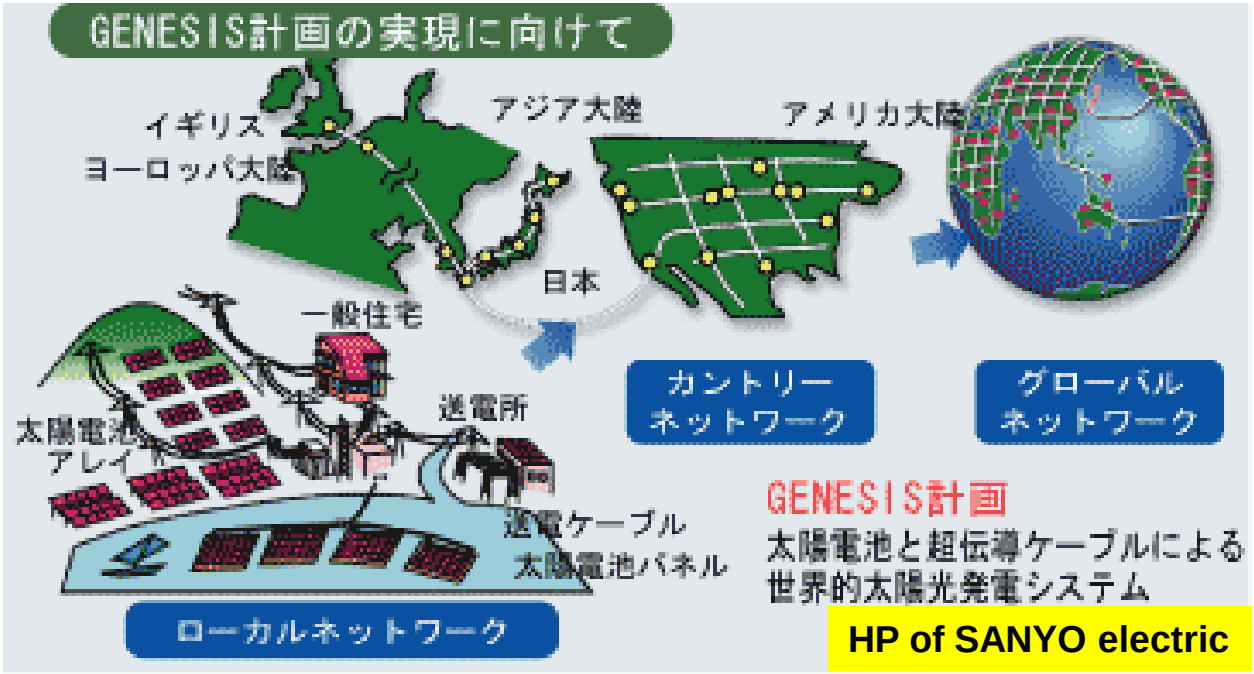
Assuming all countries become advanced ones at 2050~2100,
6 times larger electricity than today will be needed.



Renewable Energy and Superconducting Grids

DC superconducting grid --- long distance, large capacity with high energy density

Superconducting cables will not be expensive in future.



HP of SANYO electric

GENESIS project (1989)

by Y. Kuwano at SANYO electric.

worldwide PV plants
＋DC superconducting grid

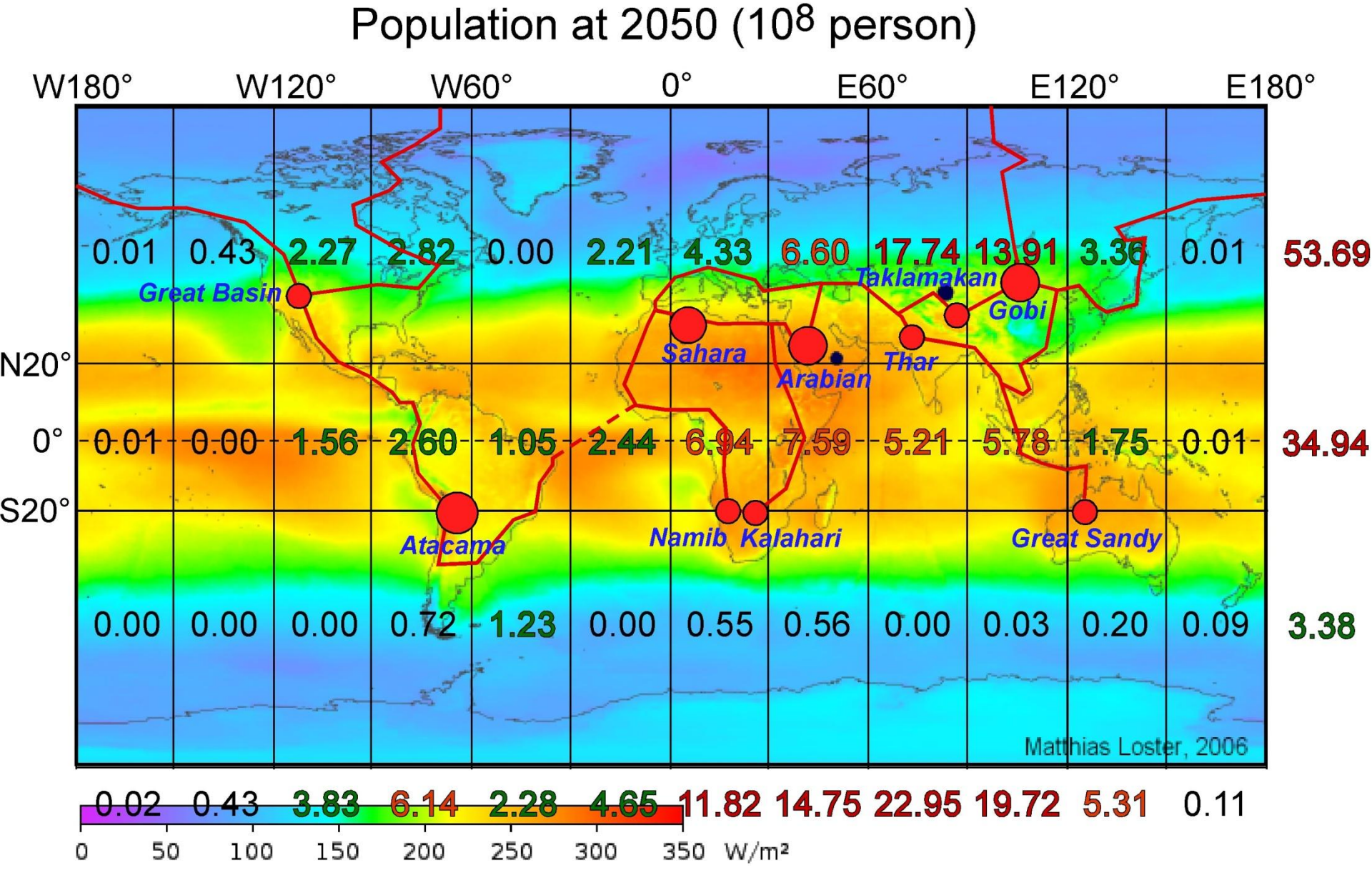
Wind electricity can be connected as proposed by Prof. Kitazawa.

Global Energy Network Equipped with Solar cells and International Superconductor grids

Merit of worldwide grid ---
equalization of electrical needs by day-and-night and seasons

Clean power supply for developing countries
New construction of power system may be easier for countries with infant infrastructure.

Minimum Superconducting Grid Covering World



Why north Atacama?

Best desert to use energy from the sun

relatively strong sunlight at ~23 degrees south latitude

highland with ~2500 m above sea level
= moderate temperature

huge flat basin mostly unexploited
= gigantic developable area

almost no rain all through the year

clear sky with few clouds and no sands

Safety area without serious natural disasters

no storms, no strong winds and no floods

few strong earthquakes