

Group Work Midterm Report

GIS Team

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Personal Theme

Solar Energy Potential



Outline of the theme

Analysis of Solar Potential Across the world

1. Theoretical PV Potential
2. Practical PV Potential
3. Economic PV Potential
4. Cumulative Installed PV Capacity
5. Cumulative Installed PV Capacity Per Capita
6. Conclusion
7. Data Source



Theoretical PV Potential

Global horizontal irradiance, the long term amount of solar resource available on a horizontal surface on Earth, measured in kWh/m²/day. It is the sum of direct (DNI) and diffuse (DIF) components.



Theoretical PV Potential



Practical PV Potential

Photovoltaic power output of a PV system (specific yield); in this case, the longterm power output produced by a utility-scale installation of monofacial modules fixed mounted at an optimum tilt, measured in kWh/kWp/day



Practical PV Potential



Economic PV Potential

Levelized cost of electricity - the lifetime costs associated with construction and operation of the power plant divided by the electricity produced during this lifetime, measured in USD/kWh (the lower the cost, the higher is the economic potential)



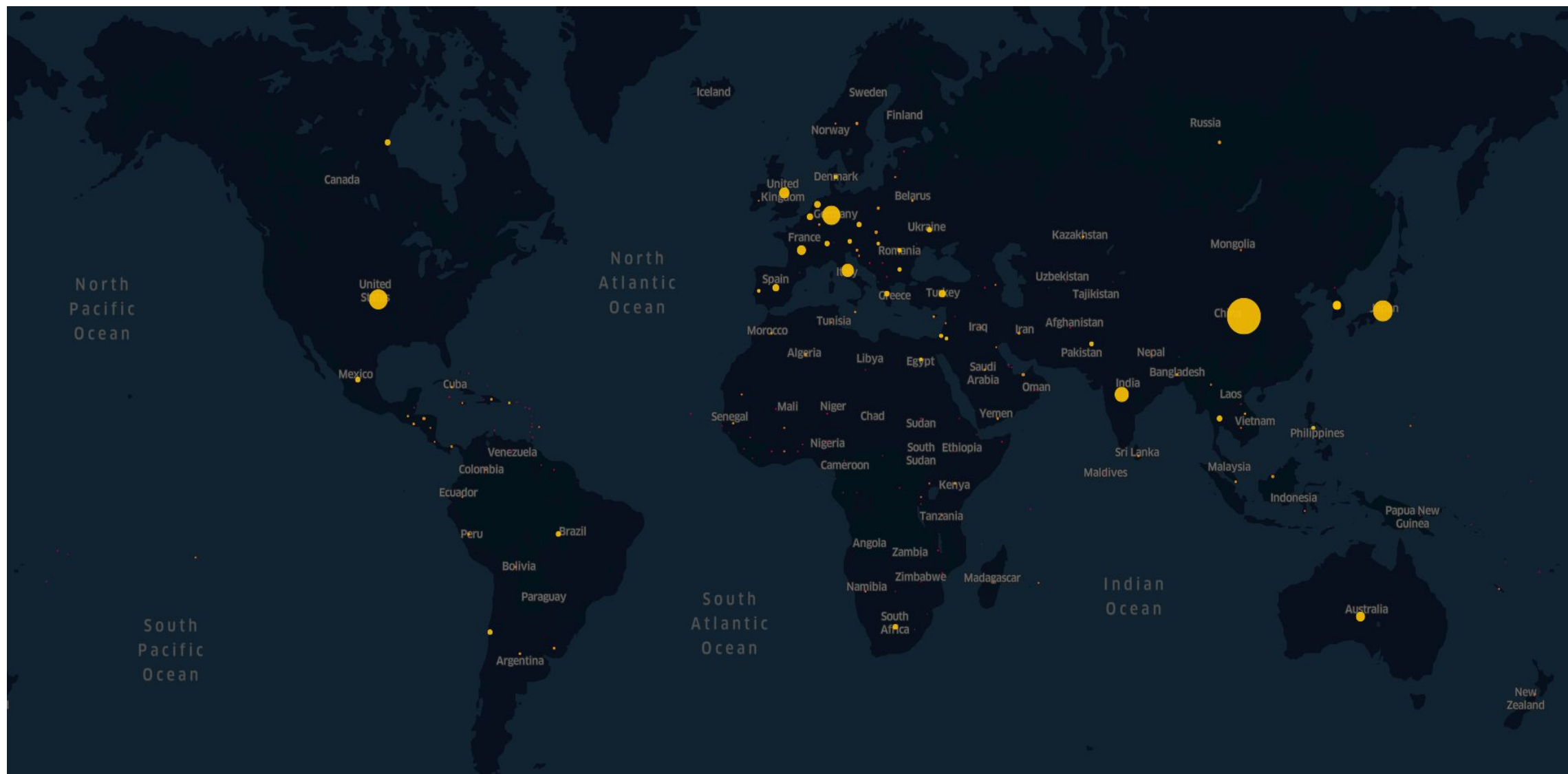


Cumulative Installed PV Capacity

Total PV module capacity installed in a particular country (until the end of 2018), measured in MWp.



Cumulative Installed PV Capacity



Cumulative Installed PV Capacity Per Capita

Total PV module capacity installed in a particular country (until the end of 2018) divided by the population of that country, measured in Wp per capita .



Cumulative Installed PV Capacity Per Capita



Conclusion

- Equatorial countries have highest theoretical and practical PV potential with middle eastern countries and sub saharan leading the way
- Tropical countries tends to have higher economical PV potential
- China, Japan, Germany, US and India are leading in total PV installed capacity
- Central Europe, Japan, US, Australia have the highest per capita PV installed Capacity



Data Source

Solargis

Average theoretical potential - GHI (kWh/m²/day)
Average practical potential - PVOUT (kWh/kWp/day)

The World Bank

Population, total (2018). Accessed on 2019-11-06.
<https://data.worldbank.org/indicator/sp.pop.totl>

IRENA

PV installed capacity (2018, Mwp)
IRENA, Renewable Capacity Statistics 2019. Accessed on 2019-06-10.
<https://www.irena.org/publications/2019/Mar/Renewable-Capacity-Statistics-2019>

