HISTORY AND FUTURE ENERGY USAGE IN THE CONTEXT OF RENEWABLE ENERGY

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THE PROBLEM

Energy usage plays a large role in providing our standard of living. Energy usage varies from electricity to charge mobile phones to powering transportation.

Why should we care?

The U.S. Energy Information Administration predicts worldwide, energy demands will increase 56% from 2010-2040. Fossil fuel usage continues to provide 80% of energy demands, causing significant impacts upon:

- Public and environmental health (e.g., carcinogens, pollution).
- Carbon emissions and contribution to climate change.
- Unstable energy prices.

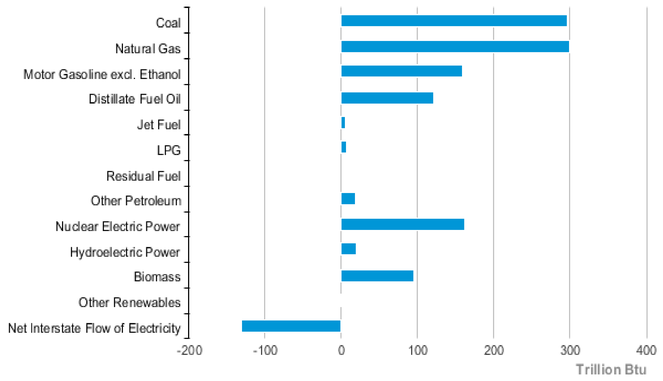
THE PROJECT

Using current literature I integrated trends and prospects to address the future potential across renewable energy sectors. The overall goal is to provide often overlooked benefits across ecological, economic and environmental domains.

Local Example:

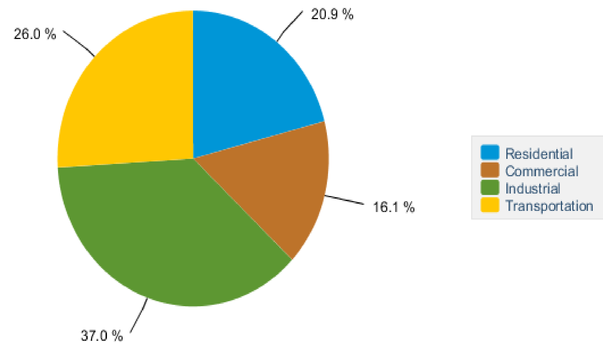
A study done at Stanford University (Jacobson et al., 2014) known as "The Solutions Project" presents direction to convert Arkansas' energy usage across all sectors to be powered solely by wind, water, and sunlight by the year 2050.

Arkansas Energy Consumption Estimates, 2012



eia Source: Energy Information Administration, State Energy Data System

Arkansas Energy Consumption by End-Use Sector, 2012



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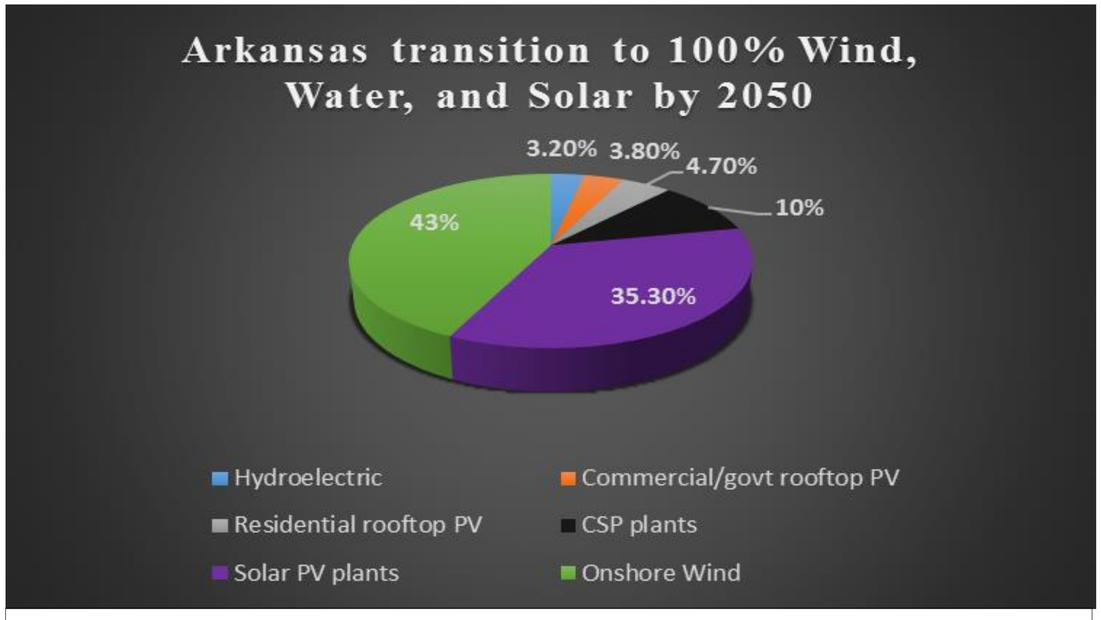

CSP = Concentrated Solar Power

PV = Photovoltaic

All developments include data upon: power grid implementation, number of turbines, land spacing, demand response management, etc., all which are technically and economically feasible (Jacobson, et al., 2014).

Other Positive Benefits:

- An overall decrease of 35.8% energy demand due to efficiency, removal of combustion, etc.
- 40-year jobs that include 57,100 construction jobs and 22,800 operation jobs.
- Overall savings of $8,700 annually per person of combined energy, health, and climate costs.

MORE EXAMPLES

(www.inhabitat.com)

The Kagoshima Nanatsujima Solar Power Plant that can solely electrify around 22,000 households.

(www.theepochtimes.com)

The Solar Impulse 2. The aircraft is able to fly day and night without the use of any fuel sources.

DISCUSSION

Energy usage is relevant to all domains of sustainability.

- Social Systems- Concerning all policy and lifestyle habits ranging from specific energy usage and efficiency that can be studied from psychological and sociological scales.
- Natural Systems- Concerning the maintenance of biodiversity and ecological well-being of the community. Further transfer to renewable sources will decrease risks of oil spills, nuclear reactor complications, etc.
- Built Systems- Concerning the design and location of wind turbines, solar panels, and overall infrastructure to optimize energy need or usage for transportation.
- Managed Systems- Concerning the economic aspects to allow healthy business models that are available to fund renewable sources.

Final Thoughts:

There is great potential that lies in renewable energy with options of:

- Wind
- Solar
- Hydroelectric
- Biomass
- Geothermal

As these infrastructures becomes more transparent, the benefits will quickly be seen:

- Public and environmental health
- Biodiversity
- Less carbon emissions
- Economic benefits including stable energy prices and decreased unemployment rates.

Literature Cited

Jacobson, et al. (2014). "100% Wind, Water, Sunlight (WWS) All-Sector Energy Plans for the 50 United States."

<http://web.stanford.edu/group/efmh/jacobson/Articles/I/USStatesWWS.pdf>

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