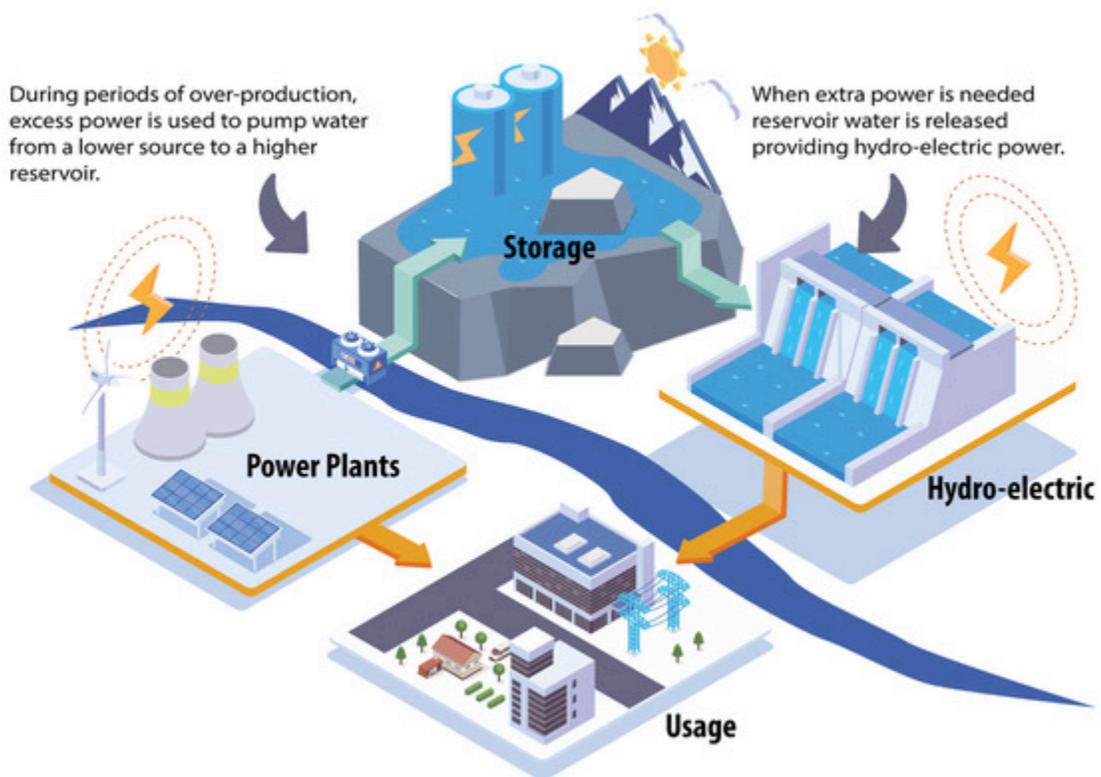


Powering Prosperity and Security: A Vision for Cross-Border Collaboration in Clean Energy

By Dr. Jeff Kleck

In an era when access to reliable, affordable power is vital for economic strength and national security, an innovative opportunity emerges along international borders—one that can address the weak points of the Texas power grid while bolstering energy security for the United States. Drawing on the example of successful international partnerships, such as the “Battery-of-Europe” collaboration between France and Switzerland, this framework envisions binational cooperation on power generation, storage, and distribution. The result is an integrated energy strategy aimed at ensuring ample electricity for growth, innovation, and prosperity.



The Battery-of-Europe Nuclear and Hydroelectric collaboration between France and Switzerland (SwissInfo, 2021)

The Power of Collaboration:

The concept of the **“Economic Battery”** borrows from Europe’s proven model, in which one nation’s surplus nuclear power continuously operates at high efficiency, while its neighbor manages complementary energy storage. France provides electricity from nuclear plants, sending excess power during off-peak times to Switzerland, which uses it to pump water into higher-elevation reservoirs. During peak demand, Switzerland releases this water to produce hydroelectric power, effectively creating large-scale energy storage.

Translating this approach to the United States and its neighbors: Mexico leverages cost-effective labor, materials, and regulatory efficiencies, which will combine well with U.S. expertise in financing, design, and nuclear fuel production. Meanwhile, 61% of Canada’s power production is hydroelectric, meaning the economic battery model could be applied directly to the United States and Canada.

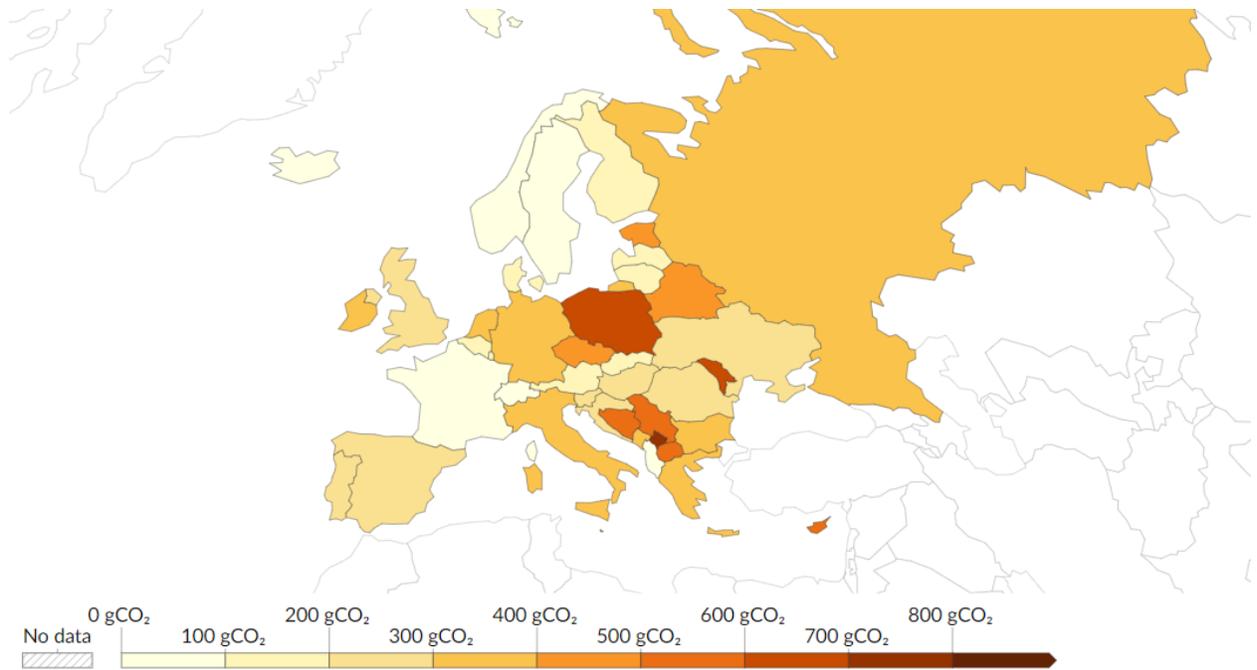
Constructing an advanced nuclear facility at the Texas–Mexico border offers a compelling example of how cross-border synergy can directly enhance energy availability. While the United States brings cutting-edge design, financial investment, and a robust nuclear supply chain, Mexico expedites construction through a shorter regulatory cycle and more affordable labor. Both of these strengths are necessary for creating the lowest possible price point for electricity. This arrangement enables continuous, high-capacity power generation to meet the increasing energy demands of the region and will allow a lower delivered cost of power than could be delivered via a domestic facility.

Moreover, existing infrastructure in Texas—including large-scale battery manufacturing facilities—can be leveraged for critical energy storage. Just as France’s steady nuclear output supports Switzerland’s hydro-pumping strategy, surplus electricity along the border could be stored in batteries or converted into other on-demand energy forms. Texas A&M University (TAMU), which hosts a leading power-engineering program, can train both American and Mexican engineers to operate and maintain these advanced systems. Four new Small Modular Reactors (SMRs) are currently planned for TAMU’s RELLIS campus, helping to create a skilled workforce aligned with long-term economic and security goals.

Along the U.S.–Canada border, several advanced-nuclear developers operate within transmission reach of major Canadian hydroelectric resources. As utility-scale projects come online for these nuclear developers, off-peak U.S. baseload can be routed north in exchange for on-peak hydroelectric imports—precisely mirroring the Battery-of-Europe model.

References and Data Sources:

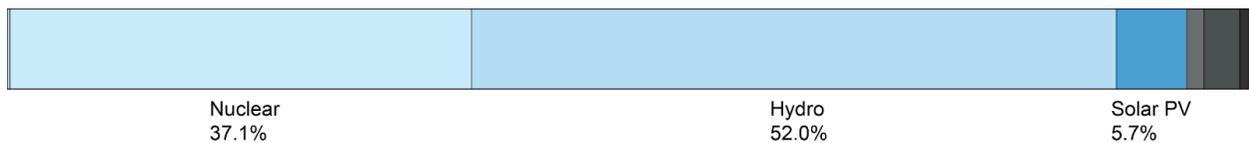
Kairos Power; TerraPower; IEEE Xplore, 2020; Bloomberg, Europe’s Green Battery



Grams of carbon dioxide equivalents emitted per Kilowatt-Hour of electricity generated in 2022 (Our World in Data)



Percentages of total France electricity generation in 2022 by source (IEA)



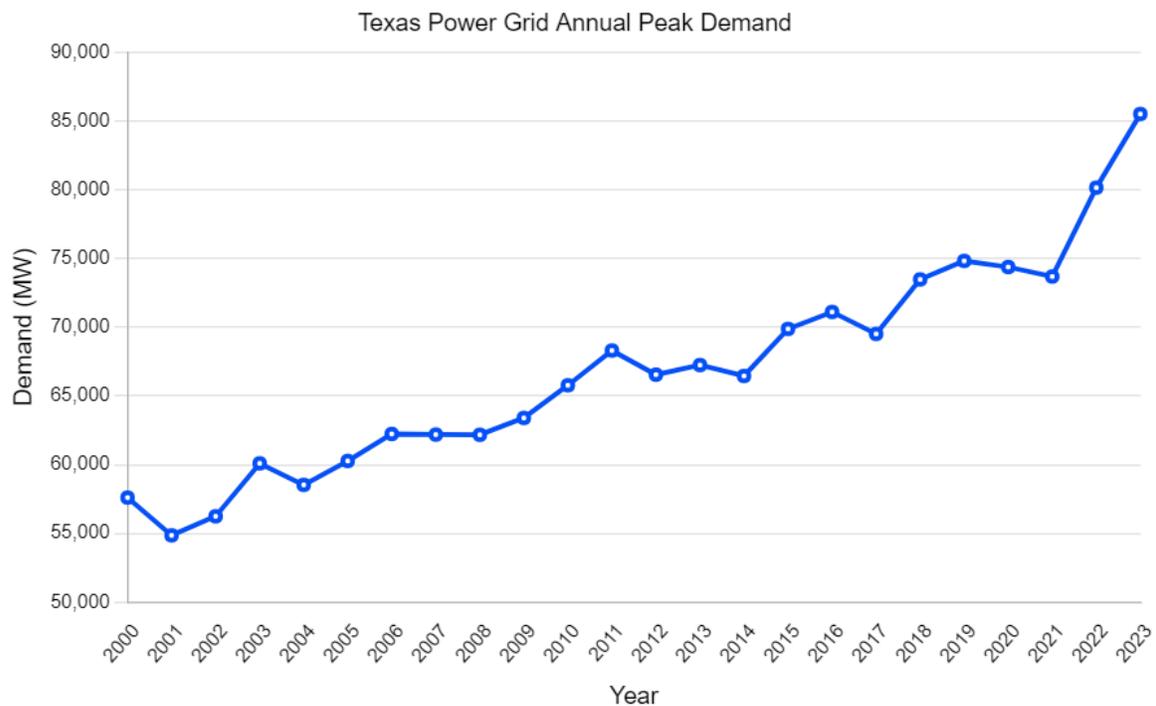
Percentages of total Switzerland electricity generation in 2022 by source (IEA)

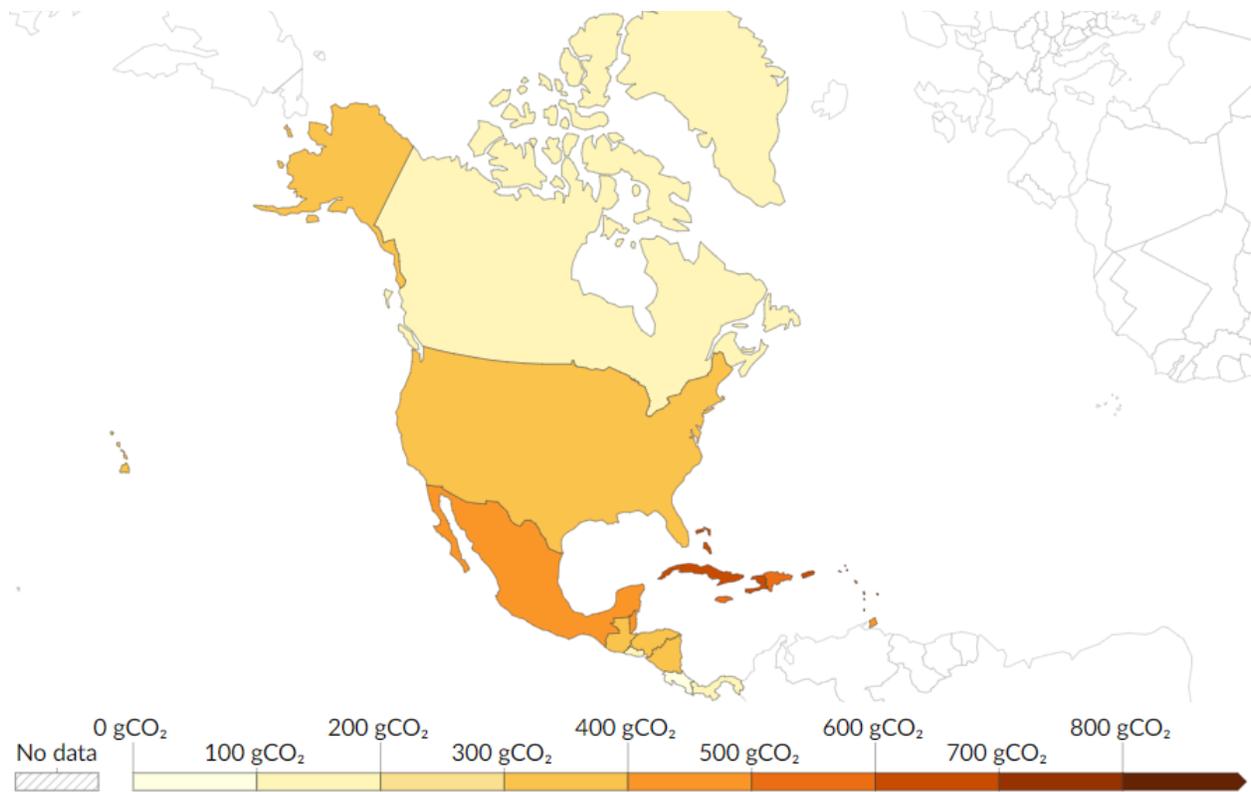
Economic Prosperity:

Cross-border **Economic Battery** communities—industrial hubs supported by abundant, reliable electricity—can drive American growth and job creation. Stable, low-cost power draws manufacturing, technology, and other energy-intensive industries, fostering local prosperity and possibly mitigating migration by providing attractive opportunities at home. Public and private investments in these communities ripple outward, improving infrastructure, increasing consumer spending, and strengthening binational cooperation.(Carnegie Endowment, 2023).

Enhancing the Texas Power Grid:

Recent events have highlighted the vulnerability of the Texas grid, which struggles during peak demand and extreme weather. Integrating a nuclear plant with supporting storage capabilities directly at the Texas–Mexico border provides a dependable energy influx that can stabilize regional supply. Nuclear power’s high capacity factor ensures a steady flow of baseload electricity, while storage systems add critical flexibility and resilience.





Grams of carbon dioxide equivalents emitted per Kilowatt-Hour of electricity generated in 2022 (Our World in Data)



Percentages of total Mexico electricity generation in 2022 by source (IEA)



Percentages of total United States electricity generation in 2022 by source (IEA)

A Blueprint for Success:

By capitalizing on cross-border economic benefits, the Economic Battery model ensures a secure source of abundant, low-cost power. The success of sustained nuclear power from France and the utilization of Switzerland's hydro-electricity to "recharge" by pumping water into higher elevation lakes during lower-use times, then releasing the water during peak use to supplement the nuclear power with hydro-electric power, is one of the most efficient examples of storing excess off-peak power for peak demand available globally. As we translate this to other nations and cities, each particular site would define which clean energy storage systems would be optimal. This model could also be applied to other critical developing technologies, such as desalination.

Conclusion:

Cross-border energy collaboration represents a powerful tool for meeting modern electricity needs while boosting prosperity and security. By uniting each nation's comparative advantages—from Mexico's cost-efficient labor and streamlined regulatory approach to the United States' technological, financial, and engineering expertise—both countries can ensure a robust, round-the-clock power supply that fuels industrial growth and stabilizes the grid in crisis situations.

Adapting the successful Franco-Swiss "Battery-of-Europe" model to the U.S.-Mexico and U.S.-Canada borders thus stands as a strategic blueprint for regional energy security. Through these partnerships, the United States can secure the additional energy generation and peak demand power it needs to scale strategically important emerging sectors such as artificial intelligence.

For more information on Open Power & Energy Network Collaborations please contact Dr. Kleck at Jeff@OpenPowerEnergy.Net.

Citations:

- [Swissinfo - Switzerland's Giant Water Battery](#)
- [Kairos Power - 4th Gen Nuclear Power](#)
- [Terra Power - 4th Gen Nuclear Power](#)
- [IEEE Xplore - Cross-Border Engineering Collaborations](#)
- [Bloomberg - Europe's Green Battery](#)
- [Carnegie Endowment - Clean Energy Supply Chains](#)
- [ASEE - Cross-Border Collaborative Learning](#)
- [ERCOT Peak Demand Records](#)
- [Our World In Data - Carbon Intensity of Electricity Generation](#)
- [IEA - World Energy Transitions Outlook](#)
- [IEA - Countries](#)
- [Canadian HydroElectric Power](#)

Data Citation Details:

Our World in Data - Maps

Ember - Yearly Electricity Data (2023); Ember - European Electricity Review (2022); Energy Institute - Statistical Review of World Energy (2023) – with major processing by Our World in Data

IEA - Graphs

Blue shades present power sources in order of increasing grams (g) of carbon dioxide (CO₂) equivalents emitted per Kilowatt-Hour (kW h) of electricity generated levels from left to right including Wind, Nuclear, Tide, Hydro, Geothermal, Solar PV, Solar Thermal

Gray shades present power sources in order of increasing grams (g) of carbon dioxide (CO₂) equivalents emitted per Kilowatt-Hour (kW h) of electricity generated levels from left to right including Biofuels, Waste, Oil, Natural gas, Coal

The Author:

Dr. Jeff Kleck, an Adjunct Professor at the Stanford University School of Medicine, boasts a distinguished career marked by technology leadership and commercial tech venture creation. The current Chairman of the Open Power & Energy Network (OPEN), Dr. Kleck brings extensive expertise across technology, academia, government, and industry. Dr. Kleck concurrently serves as a Senior Advisor to the United States Government.

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