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CLEANER BY THE DOZEN: TWELVE REFORMS TO MAKE TEXAS CLEANER, STRONGER AND FREER

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EXECUTIVE SUMMARY

Texas conservatives should look to fundamental principles in crafting a positive policy agenda on climate change. Though often overlooked, many of the best ways to improve the state's emissions profile and increase resiliency to extreme weather involve cutting regulation and taxes, and increasing the scope of markets. By removing regulatory barriers to lowering emissions in the electricity, transportation and energy production sectors, Texas can leave the next generation with a government and an economy that is both leaner and cleaner. Similarly, reforms to Texas' extreme weather policy can lessen future weather-related damage. Advancing this conservative agenda will benefit the environment and the state's economy, and will make Texans freer.

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INTRODUCTION

Climate change is a political issue that often generates more debate than insight. Discussions around this topic and the role of human activity as a causal factor are polarized and are often conducted through a partisan lens of red or blue.

All too often, the baseline assumption in a discussion about climate is that any response to the issue has to involve liberal policies and priorities—which means more government regulation and taxes, and less individual liberty and energy. While there are a number of open questions in the climate debate, it behooves conservatives—as believers in market innovation and as good stewards of the environment—to develop their own set of policies with respect to climate change.

Polling indicates widespread support for policies that address climate change. According to a recent poll, 82 percent of all respondents and 66 percent of Republican respondents favored government action to reduce carbon dioxide and methane emissions.[1] At the same time, polling shows strong support for innovation and market-based approaches to tackling climate change as an issue.[2] While there can always be debate around scientific questions, the lack of a positive policy vision can make it appear as though conservative principles are not up to the task of solving important environmental issues, but conservative principals can translate to good environmental policy.

1. "Clean Energy National Online Survey," Public Opinion Strategies, Nov. 18-21, 2021. https://www.conservativeenergynetwork.org/wp-content/uploads/2021/12/Clean-Energy-National-Survey-Online-CEN-2021.pdf.

2. Ibid.

The truth is that conservatives have plenty of positive contributions to add to the debate. Many of the most promising developments in terms of emissions reduction and clean energy technology are the result of market-driven innovation, rather than central government planning. Technological advances like digitization can be a powerful factor in improving consumers' ability to make decisions that are both good for them and good for the environment. Market-incentive structures provide consumers with products while creating smaller environmental footprints.

The last decade has seen a growing movement among business leaders, consumers and civil society toward voluntary emissions-reduction efforts. One particularly noteworthy pronouncement came from BlackRock, which manages $7 trillion in wealth, when they declared that climate change is causing a "fundamental reshaping of finance."[3] For instance, voluntary markets are emerging for carbon-removal processes in the agricultural sector.[4] Not all voluntary efforts such as this will bear fruit. Business efforts to "go green" can sometimes be more a matter of hype than substance. Other strategies within the business community focus on virtue signaling for minimal or negligible progress. Still others are spent counterproductively chasing subsidies and preserving a regulatory framework that protects them from competition. But, at the same time, many bottom-up, decentralized developments are challenging the fundamental premises behind environmental subsidies and regulation, as well as the notion that top-down measures are always necessary to induce firms to undertake environmentally responsible behavior.

However, these market-led efforts to drive innovative and economical emissions reductions often face roadblocks from government. Extensive regulatory obstacles, counterproductive subsidies and information deficiencies inhibit the natural development of the market. To avoid this, conservatives should place a strong emphasis on reducing regulatory barriers to entry, which are often sector-specific. A deeper dive into particular sectors reveals the potential for targeted regulatory reforms to bolster the American economy, lower emissions and abatement costs, and make communities more climate resilient.

Clearly, whether it is adapting to a changing climate or reducing emissions, it is imperative that policymakers unleash free enterprise, not restrict it. This undertaking is necessarily sector-specific, given the institutional and policy landscape, and to cultivate open, competitive markets and facilitate technology development. A reasonable priority is to identify reforms that remove impediments to productive capital flows and efficient risk management.

3. Ken Tysiac, "BlackRock CEO declares 'fundamental reshaping of finance,'" *Journal of Accountancy*, Jan. 14, 2020. https://www.journalofaccountancy.com/news/2020/jan/blackrock-ceo-larry-fink-reshaping-finance-22812.html.

4. "How Nori Works," The Nori Carbon Removal Marketplace, Aug. 22, 2019. https://nori.com/resources/how-nori-works.

Because of its leading position as an energy-rich, economically thriving state, Texas is an obvious choice to use as a model for this approach. Though Texas has a well-deserved reputation for valuing limited government, reforms can be made to the current system that would further reduce not only its carbon but also its governmental footprint. To that end, in this paper, we offer recommendations to reduce emissions in the electricity, transportation and energy production sectors. We also suggest ways to increase the state's resilience to drought, flooding and storms.

ELECTRICITY

The electricity sector represents the highest share of overall emissions in Texas. In 2018, 33.9 percent of total energy-related CO_2 emissions came from the electricity sector. Electricity is also the sector that has seen the biggest emissions reductions in recent years. Electricity-related emissions in Texas fell 12.5 percent between 2007 and 2018, and, in 2018, emissions were the lowest they had been since 1996.[5] This decline is even more striking when one considers that, unlike most regions of the country where electricity usage has flattened or declined, electricity use in Texas has continued to expand.

These reductions have been helped by Texas' regulatory model, which favors retail electric choice and a competitive generation market over political decision-making. An emerging body of research shows that electric competition helps keep emissions low for several reasons.[6]

First, competition provides incentives for electricity generators to cut costs, increase efficiency and voluntarily pursue prudent investments in resource deployment and innovation.[7] Empirical evidence demonstrates that competition helps drive reductions in abatement costs via improvements in generation efficiency; investments in new, low-cost technologies; and reductions in environmental compliance costs.[8] Importantly, merchants internalize investment risk, whereas regulated monopolies socialize it. This makes the competitive model conducive to encouraging deployment of innovation in new technologies that are both lower cost and lower emissions than previous generations.

5. Calculations based on EIA data.

6. See, e.g., Devin Hartman, "Environmental Benefits of Electricity Policy Reform," R Street Policy Study No. 82, January 2017. https://www.rstreet.org/wp-content/uploads/2018/04/82-1.pdf.

7. Lucas W. Davis and Catherine Wolfram, "Deregulation, Consolidation, and Efficiency: Evidence from U.S. Nuclear Power," National Bureau of Economic Research, August 2011. http://www.nber.org/papers/w17341.pdf.

8. Hartman, pp. 7-8. https://www.rstreet.org/wp-content/uploads/2018/04/82-1.pdf.

Second, competitive electricity allows for rapid shifts in the market as technology advances without the need for government direction or inducements. As a result, states with prices set by markets have tended to see electric rate declines over the past decade, whereas monopoly states have mostly seen rate increases.[9]

Third, competition makes generators more responsive to consumer demand, including the growing demand for clean or low-emissions energy. Indeed, industrial and commercial electricity consumers are leading the charge on voluntary clean energy procurement. In addition, the rise of corporate sustainability goals has amplified the appetite for clean energy, which can be procured at a lower cost in a competitive system than it can be through the incumbent monopoly model.[10] The advantages of retail electricity choice extend across all consumer classes and, when properly implemented, are key components in driving the premium for clean energy down.[11] Retail choice also presents a more efficient and equitable model to allocate a "green premium," whereby retail agreements reflect the differences between consumers in their willingness to pay for products with clean attributes. Facilitating competition for clean products organically drives their costs down, which in turn drives total abatement costs down throughout the electricity ecosystem. By contrast, mandates and subsidies for clean energy are cost additive and fail to reflect differences in consumer preference.

There are, however, strategies the state can implement to heighten the competitive efficiency of the electrical grid and help lower emissions. Below are three of the strongest reform options that Texas could—and should—adopt.

Make public the information necessary for optimal distributed-generation siting decisions

One area of striking energy innovation in recent years is the growth of so-called distributed generation or distributed energy resources (DERs). While defying easy categorization, DERs include all resources located on the distribution system, rather than those that come from large power plants. The Federal Energy Regulatory Commission (FERC) defines DERs as:

> Any resource located on the distribution system, any subsystem thereof or behind a customer meter. These resources may include, but are not limited to, resources that are in front of and behind the customer meter, electric storage resources, intermittent generation, distributed generation, demand response, energy efficiency, thermal storage, and electric vehicles and their supply equipment—as long as such a resource is located on the distribution system, any subsystem thereof or behind a customer meter.[12]

Where DERs are located can have implications for the electric grid. In some areas, DERs may increase the reliability of the grid or lower costs, whereas in other areas, adding additional DERs could trigger the need for expensive infrastructure upgrades to maintain reliability. Some utilities have responded by imposing punitive or wide-ranging fees on certain types of DER installation. For example, the Pedernales Electric Cooperative recently began imposing a $500 fee on members who install solar panels on their homes and has considered enacting new transmission and peak-demand charges for those customers.[13]

To maximize the benefits of new DERs, developers need access to information about hosting capacity. Hosting capacity is "the amount of DER that can be accommodated without adversely impacting power quality or reliability under current configurations and without requiring infrastructure upgrades."[14] Distribution utilities typically maintain information about the hosting capacity of different locations. But this information is not typically made available to the public. Without access to hosting-capacity information, developers have to rely on the interconnection process to determine the feasibility of potential DER projects, which increases costs for developers and for the utility. Putting hosting-capacity information online would help DER developers better match the siting of their facilities to the needs of the grid.

Information about the capabilities of distribution utilities can be used by developers to more cost effectively locate solar and storage resources, as well as help the distribution utility better plan for future investments in the distribution system. As the utility sees more investment in DERs, hosting capacity can help the distribution utility identify areas of their system where investments are needed to enable and integrate these DERs into the system. This can also lead to the use of non-wires solutions, in which the utility uses DERs to delay or mitigate the need for new infrastructure. Such opportunities can reduce overall costs to customers while providing additional revenue opportunities for DER owners.

9. Philip R. O'Connor, "Restructuring Recharged: The Superior Performance of Competitive Electricity Markets 2008-2016," Retail Energy Supply Association, April 2017. https://www.resausa.org/sites/default/files/RESA_Restructuring_Recharged_White%20Paper_0.pdf.

10. "2020 Priorities," Electricity Consumers Resource Council, 2019. https://elcon.org/wp-content/uploads/ELCON-2020-Outlook.pdf.

11. Hartman. https://www.rstreet.org/wp-content/uploads/2018/04/82-1.pdf.

12. "Federal Energy Regulatory Commission, Order Number 2222: Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators," Docket No. RM18-9-000, 172 FERC ¶ 61,247, Sept. 17, 2020, p. 114. https://www.ferc.gov/sites/default/files/2020-09/E-1_0.pdf.

13. "Distributed Generation (DG): FAQs," Pedernales Electric Cooperative, Inc., last accessed April 7, 2022. https://www.pec.coop/your-service/distributed-generation.

14. "Distribution Feeder Hosting Capacity: What Matters When Planning for DER?," Electric Power Research Institute, April 15, 2015, p. 2. https://www.epri.com/research/products/000000003002004777.

Hosting capacity can also be used to identify optimal locations for the siting of direct current fast chargers (DCFCs) to support electric vehicle (EV) deployment across the state. DCFCs will require significant amounts of electricity and power to meet demand, and identifying locations that are capable of delivering such needs early will help minimize the need for infrastructure investments up front, which will lower the overall cost of installing DCFC equipment.

Allow more dynamic pricing to achieve least-cost-demand response

For the electric grid to function properly, supply (the amount of electricity generated) and demand (the amount of electricity used by consumers) must be perfectly matched in real time. Within the Electric Reliability Council of Texas (ERCOT) market, this matching is achieved using prices. Historically, price signals have operated almost exclusively on the supply side of the equation. As demand increases, prices rise, sending market signals that bring more generators online. Power plants ramp up or down and come online or shut down based on changes in the total amount of electric demand at any given point. But prices have traditionally done very little to keep demand down during times of scarcity. There are some small programs in which commercial or industrial customers are compensated for agreeing that they will shut down when called upon to do so by ERCOT. But, for the most part, authorities are limited to issuing public pleas for conservation. The stark contrast between the responsiveness of supply and demand can be seen by comparing the Texas wholesale electric market—where prices are usually very low but can occasionally spike to extremely high levels—with the Texas retail market—where the vast majority of customers buy electricity on fixed-rate plans.

Over the last few years, a small number of companies have begun offering retail customers plans with rates indexed to the real-time wholesale market. The theory behind these plans is that consumers could reap the benefits of low wholesale market prices in normal times while reducing their electric consumption during high-price periods, thus saving money overall. The downside of this approach, however, was seen in 2021 during Winter Storm Uri, when a handful of customers ended up with monthly bills in excess of $10,000.[15] In response, the Texas legislature banned companies from offering retail electric plans with rates indexed to the wholesale electric market.[16]

Unfortunately, in implementing this legislation, the Public Utility Commission of Texas (PUC) has issued an overly broad rule that would prohibit many types of potentially valuable dynamic pricing that could enable price responsiveness from consumers. The rule bans all retail electric plans that have rates that vary within a monthly billing cycle and makes it more difficult for rates to vary even from month to month.[17]

While the desire to shield consumers from exorbitant bills is laudable, the PUC rule goes to the other extreme. By shielding consumers from any price variability, the benefits of demand responsiveness to price are eliminated. This is particularly unfortunate, as technological advances are now opening up a range of possibilities for dynamic pricing that could save consumers money overall, while making the grid more reliable and reducing emissions.

The lack of dynamic pricing also means that it takes longer to recoup the costs of investments in DERs. This cost issue, coupled with a lack of retail demand for response products more generally, means that these resources are not able to economically contribute to easing system constraints or be paid for their contribution. As the ERCOT market generally relies on price signals to identify the need for new generation, these price signals can also be used on the demand side to encourage greater amounts of demand response, energy efficiency and DERs more broadly. Such resources offer the customer an opportunity to not only save money, but also to make money as a grid service. The PUC's action should therefore be rolled back to reflect the legislature's intent to ban index pricing rather than all dynamic pricing.

Allow batteries to participate in the ancillary services market where technically feasible

Another new technology with significant emissions reduction potential is battery storage. Batteries not only complement variable generation resources such as wind or solar, but they can also serve as a means to shift electricity generation from nonpeak to peak periods, resulting in a more reliable and cheaper electric grid.

Texas lawmakers should ensure that existing regulations do not shut out batteries or other forms of energy storage from places where they could provide value. A clear example of this can be seen in the market for ancillary services.

The ancillary services market grows out of the fact that scalable storage for electricity based on changes in electric demand have not been possible historically. Grid stability requires that the amount of electricity generated must match electricity consumed on a minute-to-minute and

15. Giulia McDonnell Nieto del Rio et al., "His Lights Stayed on During Texas' Storm. Now He Owes $16,752," *New York Times*, Feb. 20, 2021. https://www.nytimes.com/2021/02/20/us/texas-storm-electric-bills.html.

16. Texas Utilities Code 39.110.

17. "Order Adopting Amendments to 16 TAC §25.43, 25.471, 25.475, 25.479, AND 25.498 and New 16 TAC §25.499 as Approved at the December 16, 2021 Open Meeting," Public Utility Commission of Texas, Project 51830, Item 37, Dec. 20, 2021. https://interchange.puc.texas.gov/Search/Filings?ControlNumber=51830.

even a second-to-second basis. This can pose challenges, as sudden changes in either electric supply (e.g., from a power plant suddenly and unexpectedly having to go offline) or in electric demand (e.g., industrial processes can involve sudden drastic changes in electricity consumption) can create gaps between supply and demand.

To meet these contingencies, the Texas grid manager, ERCOT, contracts with generators to keep enough capacity in reserve to meet these gaps. This system of payments, which are separate from the payments made in the wholesale energy market, flow from the ancillary services market. There are currently five types of ancillary services used in ERCOT that are distinguished by how fast generators are expected to respond and how long they are expected to generate: regulation up, regulation down, responsive reserves, the ERCOT contingency reserve service (ECRS) and non-spinning.[18]

Battery storage is a natural fit for some parts of the ancillary services market. However, recently proposed mandated-duration requirements for ancillary services in ERCOT could exclude many batteries and energy storage options unnecessarily. According to the proposal, batteries would have to be able to run for two hours to qualify for ECRS. The ECRS requires resources to deploy within 15 minutes of being called upon, but there is no technical reason why resources must be able to last two hours when called upon. Similarly, proposed ERCOT rules would mandate a four-hour duration requirement for non-spin that is not necessary from a technical perspective.[19] These duration mandates would drastically reduce the number of batteries eligible for ancillary services and ought to be reversed.

TRANSPORTATION

After electricity, the largest percentage of Texas' emissions come from the transportation sector. In 2018, 32.1 percent of total energy-related CO_2 emissions for the state came from the multimodal transportation sector, which includes both on-road and non-road emissions related to transportation, industry, and commercial and residential construction. Roughly three-quarters of transportation sector emissions come from on-road emissions from vehicles.[20]

Emissions-reduction efforts for transportation are mostly a matter of federal law and policy, with federal engine and fuel controls under the Clean Air Act being implemented jointly by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Transportation (USDOT). However, there is one area where state policy can play a productive role: the emergence of EVs, which has the potential to substantially alter the transportation emissions landscape. The U.S. Energy Information Agency (EIA) projects that, by 2027, over 1 million EVs and hybrid vehicles will be sold in the United States every year.[21]

The federal government and some states have attempted to promote EV sales through the use of subsidies and other tax rebates for EV purchases. Yet research suggests these subsidies have only a marginal benefit and are quite expensive for what they achieve. EV subsidies cost somewhere between $350 and $640 per ton of greenhouse gas abated.[22] This is partly due to the fact that most EV purchasers historically would have bought their EV even without the subsidy, and partly due to the high level of subsidy.[23]

There are, however, ways to better integrate EVs into the Texas transportation system. In pursuit of this goal, Texas should make the following changes to current law.

Allow manufacturers to sell EVs directly to consumers

Texas law provides that "a person may not engage in the business of buying, selling or exchanging new motor vehicles" unless they hold a franchise vehicle license for that type of vehicle.[24] Vehicle manufactures are themselves prohibited from holding a license, or from having an ownership interest in a franchise dealer or dealership.[25]

EV manufacturers have long argued that having to sell exclusively through a franchise dealership impedes EV sales. EVs have different characteristics than traditional combustion vehicles and appeal to customers based on different considerations that may not be a good fit for sales through franchises. EVs also have fewer ongoing maintenance and service needs, and, given the revenue generated to dealerships

18. Josiah Neeley, "Requiring renewables to purchase replacement power is a mistake for Texas," R Street Institute, April 27, 2021. https://www.rstreet.org/2021/04/27/requiring-renewables-to-purchase-replacement-power-is-a-mistake-for-texas.

19. "NPRR1096" Electric Reliability Council of Texas (2022). https://www.ercot.com/mktrules/issues/NPRR1096.

20. "Technical Report: Statewide On-Road Greenhouse Gas Emissions Analysis and Climate Change Assessment," Texas Department of Transportation, Oct. 2018. https://ftp.txdot.gov/pub/txdot/get-involved/sat/loop-1604-from-sh16-i-35/091020-greenhouse-gas-report.pdf.

21. Annual Energy Outlook 2021," Energy Information Agency, Table 38, last accessed April 7, 2022. https://www.eia.gov/outlooks/aeo/data/browser/#/?id=48-AEO2021&region=1-0&cases=ref2021&start=2019&end=2050&f=A&linechart=-----ref2021-d113020a.15-48-AEO2021.1-0--ref2021-d113020a.62-48-AEO2021.1-0--ref2021-d113020a.63-48-AEO2021.1-0-ref2021-d113020a.64-48-AEO2021.1-0&map=ref2021-d113020a.5-48-AEO2021.1-0&ctype=linechart&chartindexed=0&sid=-&sourcekey=0.

22. Kenneth Gillingham and James H. Stock, "The Cost of Reducing Greenhouse Gas Emissions," *Journal of Economic Perspectives* 32:4 (Fall 2018), pp. 53-72. https://scholar.harvard.edu/files/stock/files/gillingham_stock_cost_080218_posted.pdf.

23. Jianwei Xing et al., "What Does an Electric Vehicle Replace?" SSRN, Feb. 16, 2021. http://dx.doi.org/10.2139/ssrn.3333188.

24. Texas Occupations Code § 2301.252

25. Texas Occupations Code § 2301.476(c).

through vehicle maintenance and servicing, some manufacturers worry that franchise dealerships may not have the properly aligned incentives to maximize EV sales. As a result, the main EV manufacturers have so far been unwilling to sell vehicles in Texas through franchise dealerships. Texas should end this impediment to EV sales in the state and allow EV manufacturers to sell directly to consumers.

Adopt an EV fee based on number of miles traveled

Integrating EVs into the system will also require adapting how Texas funds its transportation infrastructure. In theory, Texas' gasoline tax is supposed to function as a kind of user fee for vehicles. The more you use the roads, the more gasoline you consume, the more you pay for the building and upkeep of Texas' transportation infrastructure. In practice, of course, things are not quite so simple. For example, some of the money raised via the gas tax is diverted for non-road purposes. More to the point, the gas tax does not take into account the increasing fuel efficiency of vehicles, nor the fact that alternative fuel vehicles like EVs do not pay the gas tax at all. So long as EVs remain a small fraction of total vehicles, the fact that they do not pay the gas tax is not a major cause for concern. However, as EVs make up a larger and larger proportion of cars on the road, the current system will become unsustainable. Figuring out how to get EVs to pay their fair share of road funding is, therefore, an important part of their widespread deployment.

Certain states have attempted to address this issue by imposing a flat, yearly registration fee on EVs.[26] While administratively simple, these fees are often far above what the typical Texan with a combustion vehicle pays in gasoline tax a year. If it is unnecessarily high, an EV fee can go from being a road-funding alternative to a punitive measure. Instead, any such fee should approximate the amount that the EV would have paid into state coffers based on the average miles traveled by that vehicle class.

ENERGY PRODUCTION

Texas is not only a big consumer of energy, it is also a major producer of energy. From substances deep underground to the sun shining and wind blowing, Texas has a wide variety of energy resources. While we expect Texas to remain a leader in the production of traditional fuel sources, there is also a lot of potential for new and developing energy sources.

For Texas to continue to be a dominant energy state, it needs to be innovative. First and foremost, this means innovation in the marketplace. A market-driven, consumer-centric approach to innovation incentivizes companies to provide families and businesses with the goods and services they want while using fewer resources and emitting fewer emissions. But allowing market innovation can require regulatory innovation as well because older regulatory structures may not be a good fit for new technologies.

To maintain Texas' position as an energy-production leader while also keeping emissions low, we recommend the following.

Clarify right to produce geothermal energy

A promising new source of energy production in Texas is geothermal energy. Producers harness the heat of the earth's core by pumping hot water from deep underground and using it to generate electricity, after which the water can be returned underground. Geothermal energy is abundant, and businesses are increasingly looking for ways to make geothermal energy production economic.[27]

An unresolved legal issue surrounding geothermal energy concerns ownership rights. Texas law recognizes a distinction in the ownership of a piece of real property between the surface estate (which includes the right to build a house on a parcel of land or graze cattle on it) and the mineral estate (which includes the right to produce oil from beneath the ground on that same parcel of land). These two rights are severable, meaning that a landowner can sell the mineral estate to his property while retaining the surface estate. Many pieces of property have separate owners for the surface and mineral estate.

While the scope of the mineral estate is well defined when it comes to things like oil and gas, it is legally unclear whether the right to produce geothermal energy from a piece of land is part of the mineral estate or the surface estate. The matter might seem to have been resolved by the Texas Geothermal Resources Act of 1975, which provides that,

> Since geopressured geothermal resources in Texas are an energy resource system, and since an integrated development of components of the resources, including recovery of the energy of the geopressured water without waste, is required for best conservation of these natural resources of the state, all of the resource system components, as defined in this chapter, shall be treated and produced as mineral resources.[28]

However, subsection 5 of the Act goes on to say that "in making the declaration of policy in Subdivision (4) of this section,

26. Kristy Hartman and Laura Shields, "Special Fees on Plug-In Hybrid and Electric Vehicles," National Conference of State Legislatures, Oct. 12, 2021. https://www.ncsl.org/research/energy/new-fees-on-hybrid-and-electric-vehicles.aspx.

27. Maria Richards, "Got geothermal? Texas does, and ought to tap the resource," *Austin American-Statesman*, March 29, 2021. https://www.statesman.com/story/opinion/columns/your-voice/2021/03/29/opinion-got-geothermal-texas-does-and-ought-tap-resource/6974815002.

28. Texas Occupations Code § 2301.476(c).

there is no intent to make any change in the substantive law of this state, and the purpose is to restate the law in clearer terms to make it more accessible and understandable."[29] Unfortunately, the aim of clarity in this case appears to have been unsuccessful, as subsection 5 has led many to question whether geothermal production is truly part of the mineral estate in Texas.[30]

This confusion has the potential to stymie the development of geothermal energy production, and the lack of secure and well-defined property rights is a major impediment to capital investment. Texas should resolve this matter and clarify which estate includes the right to produce geothermal energy.

Clarify pore space rights for carbon capture, utilization and storage

Oil and gas production are central to the Texas energy story, and this will remain true for the foreseeable future. While some on the political left would like to see an end to fossil fuel use, oil and gas production and a clean environment do not have to be in conflict. Technologies already exist that allow for the production of oil and gas resources without a resulting increase in atmospheric greenhouse gases. With carbon capture, utilization and storage, CO_2 created during the production process is collected and then reinjected underground.[31] Carbon capture technology was first widely utilized during the fracking boom, as injections of CO_2 can help with unconventional oil and gas production. More recent proposals contemplate permanent storage of CO_2 in space left after oil and gas in an area has been removed, or in other geologically appropriate locations underground.

Securing access to the underground space, or pore space, needed to store large amounts of CO_2 faces a series of related but distinct issues to those discussed above regarding geothermal energy production. The underground cavities in which CO_2 is to be injected tend to be quite large, and in most cases will lie beneath the surface of multiple properties. Because gas injected at one location tends to migrate throughout the entire space, this could be found to constitute a trespass on the adjoining property owner's land. To preclude this, companies wanting to inject CO_2 for storage could need to individually negotiate with the owners of multiple adjoining properties, which can be costly and serve as an impediment to such projects.[32]

Texas currently lacks legislation or court decisions clarifying the scope of these rights. As noted in a report commissioned by the Texas General Land Office, Texas would "benefit from clear rules about how these rights will be recognized and protected, as well as a process for assuring that the storer secures the legal property right to store carbon dioxide."[33]

Exempt flared gas from severance tax if used for production

People commonly speak of links between oil and gas production for a reason. When crude oil is pumped out of the ground it brings with it associated gases. Often, this associated gas is captured and sold or transported for use in the wider economy. However, in some cases, a lack of infrastructure or other factors make this uneconomical. In those cases, the gas is burned on-site, or "flared." From an environmental point of view, gas flaring results in additional emissions, particularly of methane.[34] From an economic point of view, flaring involves the waste of a potentially valuable resource.

While market incentives are driving producers to reduce the amount of gas that ends up being flared, the current tax structure makes that more difficult. Texas maintains a severance tax on oil and gas produced in the state. Natural gas producers in Texas are required to pay a tax of 7.5 percent on the market value of the gas sold.[35]

Because flared gas is by definition not sold, companies do not have to pay severance tax on it. However, if a well switches from flaring its gas to selling it, then it must begin to pay severance tax on that gas. This creates a disincentive to reduce flaring. Wyoming recently passed legislation that exempts flared gas from severance tax when it is put to productive use.[36] Texas should adopt similar legislation.

Urge Congress to allow faster licensing for small nuclear power plants

Despite the growth of renewable energy as a part of America's fuel mix, nuclear power remains the largest single source of zero-CO_2 electricity. In Texas, nearly 5000 MW of power is currently provided by the Comanche Peak and South Texas Project nuclear plants. New developments in nuclear power have been stifled by a 20th century regulatory system that is not a good fit for innovation or newer designs. Under the

29. Texas Natural Resources Code 141.002(4).

30. Texas Natural Resources Code 141.002(5).

31. "Carbon dioxide capture and sequestration: overview," U.S. Environmental Protection Agency, Jan. 19, 2017. https://19january2017snapshot.epa.gov/climatechange/carbon-dioxide-capture-and-sequestration-overview_.html.

32. Kenneth B. Medlock III and Keily Miller, "Carbon Capture in Texas: Comparative Advantage in a Low Carbon Portfolio," Rice University's Baker Institute for Public Policy, June 2020. https://www.bakerinstitute.org/media/files/files/82bcb758/ces-pub-carboncapturetx-062920.pdf.

33. "Injection and Geologic Storage Regulation of Anthropogenic Carbon Dioxide: A Preliminary Joint Report," The Bureau of Economic Geology, Dec. 1, 2010, p. 64. https://www.law.uh.edu/faculty/thester/courses/Climate%20Intervention%20Law%202019/Class%20readings/CCUS/SB%201387%20Report%20FINAL.pdf.

34. Rebecca Schultz et al., "Flaring Emissions: Not on Track," International Energy Agency, November 2021. https://www.iea.org/reports/flaring-emissions.

35. "Natural Gas Production Tax," Texas Comptroller of Public Accounts, last accessed April 7, 2022. https://comptroller.texas.gov/taxes/natural-gas.

36. Wyoming Statute § 39-14-205.

Nuclear Regulatory Commission (NRC), a one-size-fits-all regulatory regime has helped create an environment where no new commercial nuclear plants have become operational in over 40 years.

Federal regulation does allow a less burdensome regulatory pathway for smaller reactors, but only if they are not used commercially. While commercial NRC licenses are currently granted through section 103 of the Atomic Energy Act (AEA), research reactors are licensed through a more flexible process under section 104c.[37] Reactors licensed under this process can have up to 10 MW of capacity but cannot generate revenue in excess of 50 percent of their expenditures. Texas currently has multiple microreactors in operation for research purposes with installed capacities of between 1 and 5 MW. Because the safety and risk issues associated with nuclear plants are the same regardless of whether the reactor is used commercially, this limitation makes little sense.[38]

The licensing process for nuclear plants is a matter of federal law, and, thus, Texas cannot directly act to fix this discrepancy. Still, Texas lawmakers should urge Congress to update the law to allow for quicker licensing of microreactors and to right-size regulation to the risk of the particular type of reactor, rather than continue to treat all commercial reactors as if they were the same.

ADAPTATION

In addition to measures that will help reduce emissions, Texas can also adopt policies that will help better manage a warmer, changing climate. Texas has long faced a variety of challenges created by extreme weather events ranging from droughts to severe flooding to hurricane risks. According to projections, a warmer world will exacerbate all of these challenges.[39] Fortunately, the state can implement strategies to become more resilient to extreme weather events. The old Boy Scout motto is applicable here: be prepared.

DEAL WITH DROUGHT

A decade ago, Texas was in the midst of one of the most severe droughts in state recorded history. According to the Palmer Drought Severity Index, the 2010 to 2014 drought was the second-longest lasting and included the driest 12-month period on record.[40] In 2011 alone, the drought resulted in nearly $8 billion in agricultural losses.[41] While it is hard to quantify the degree to which climate change contributed to the 2010 drought, warmer temperatures are likely to exacerbate current water scarcity problems in the coming decades. Hotter temperatures mean faster water evaporation from soil, making drought more likely in certain areas. Rising temperatures can also alter weather patterns, leading to lower levels of rainfall or longer dry periods punctuated by heavy flooding.[42] Such changes in rainfall patterns could themselves lead to periods of prolonged drought. Temperature increases can also cause shifts that restructure which areas are best for growing different crops, making it harder to use some land for its historical agricultural purpose.

The good news is that mechanisms already exist to help Texas adapt to these changes: water markets.[43] Water markets can help Texas meet its challenges in two ways. First, water markets incentivize conservation and the more efficient use of limited resources. Prices serve as a powerful signal to users about the scarcity of a resource, inspiring them to reduce wastage and find ways to make do with less. Research suggests that a 10 percent increase in water prices reduces water demand in the short term by 3 to 4 percent for residential users and by nearly 5 percent for agricultural users.[44]

Second, market trading helps ensure that water flows toward its highest and best use. If the value of water to a farmer is less than the value that water would have to a factory, the owners of the factory can purchase the water right from the farmer, leaving both better off. Given changes in population, agriculture and the wider economy over time, it is only natural that the most valuable uses of particular water diversions will change. As these shifts occur, water originally dedicated to one purpose can be rededicated to new ones. Texas statutes recognize that meeting future water needs will require the "voluntary redistribution of water resources," which is best achieved through water markets.[45]

Texas' water market system is impeded by a complicated and often bureaucratic process. The legal framework for water rights differs depending on whether the water in question

37. 42 U.S. Code § 2134(c).

38. Jessica Lovering et al., "Planting the Seeds of a Distributed Nuclear Revolution," The R Street Institute, October 2019. https://www.rstreet.org/wp-content/uploads/2019/10/microreactors-report_Final_Final.pdf.

39. John Nielsen-Gammon et al., "Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036," Office of the Texas State Climatologist, Oct. 7, 2021. https://climatexas.tamu.edu/files/ClimateReport-1900to2036-2021Update.

40. "Water for Texas: 2017 State Water Plan," Texas Water Development Board, 2017, p. 32. http://www.twdb.texas.gov/waterplanning/swp/2017/doc/2017_swp_adopted.pdf.

41. Staff writer, "Drought cost Texas close to $8 billion in agricultural losses in 2011, study finds," *Austin American-Statesman*, March 21, 2012. https://www.statesman.com/story/news/2012/09/01/drought-cost-texas-close-to-8-billion-in-agricultural-losses-in-2011-study-finds/9889558007.

42. "Fifth Assessment Report," Intergovernmental Panel on Climate Change, 2014, pp. 735, 745. https://www.ipcc.ch/report/ar5.

43. Josiah Neeley, "Water Markets as a Response to Climate Change," R Street Institute, Property and Environment Research Center, February 2018. https://www.perc.org/wp-content/uploads/2018/02/water-markets-response-climate-change.pdf.

44. Terry L. Anderson et al., *Tapping Water Markets* (RFF Press, 2012), pp. 13-14.

45. Texas Water Code Section 16.051(d).

is surface water such as water found in rivers, lakes and streams or whether it is groundwater pumped from beneath the earth. Unlike groundwater, the production of which is a private property right tied to the ownership of land, surface water is owned and regulated by the state.

While surface water itself is considered public property, individuals may have a recurring right to divert a certain quantity of water from a particular location for a specified use. These surface-water rights are based on historical use but can be bought or sold. In cases where there is not enough water to safely allow all water right holders to fully exercise their right, older rights are given precedence over newer (more junior) rights.

In many respects, surface-water rights function like a private-property right. However, the highly specified nature of the right can limit its ability to be freely traded on the open market. Water rights specify not only a quantity of water and a diversion point, but also the way the water will be used. To be recognized as a right, the water must be used for one of a number of statutorily designated beneficial uses." Further, any attempt to change elements of the right, for example by changing from one recognized beneficial use to another, requires approval by the Texas Commission on Environmental Quality (TCEQ) and can trigger a time-consuming, contested-case process. In one case, the city of Marshall, Texas, saw its application to add an additional beneficial use to its water right languish for six years before ultimately being withdrawn.[46]

To take full advantage of water markets that can adapt to changing weather patterns and a warmer future, we recommend making the following changes to Texas law.

Streamline change-of-use amendments for water rights

The requirement for pre-approval for a change of use in water rights is justified on the grounds that different uses of water can have different hydrological effects. Water used for one purpose, such as irrigation, may have a higher likelihood of ending up back in the water source after use than if the same water were used for municipal drinking water, which has less runoff. Changing the use could, therefore, result in lower return flows and less water ultimately available for other rights holders.

While this is a reasonable concern, it is worth noting that changes within a beneficial use category can also affect return flows. For example, a farmer adopting more efficient irrigation practices could lessen run off. Yet this does not (and should not) require regulatory pre-approval.

46. Kathleen Hartnett White et al., "The Case for a Texas Water Market," Texas Public Policy Foundation, April 2017, p. 9. https://www.texaspolicy.com/wp-content/uploads/2018/08/2017-04-RR-WaterMarkets-ACEE-KHartnettWhite.pdf.

Some states have streamlined or automated approval processes for certain use changes. For example, in Nebraska, a water-right amendment may be approved without notice or a hearing if the water is to be used exclusively for irrigation.[47] Texas should expand the use of expedited or automatic approvals for cases where use changes are unlikely to harm the rights of others.

Eliminate limitations on interbasin transfers

Additional restrictions exist for transfers of water between basins. Given the vast disparities in average rainfall between different parts of Texas, interbasin water transfers are a logical instance of water markets in action. Future interbasin transfers form a critical part of the long-term water planning for several regions in the state. Market-based interbasin transfers are, of course, also beneficial to the basin of origin. One analysis commissioned by the Texas Water Development Board found that a group of interbasin transfers resulted in between $68 billion and $1.3 trillion in economic benefits to the basins of origin.[48]

Yet existing state law severely limits the practicality of interbasin transfers. Before granting a permit for an interbasin transfer, the TCEQ must conduct multiple hearings with notice and comment from a wide variety of sources—including every county judge in the basin—and the transfer must meet a variety of criteria beyond even an ordinary permit change. To approve the transfer, state regulators in Texas must consider factors ranging from "the need for the water in the basin of origin," the "availability of feasible and practicable alternative supplies," the "projected economic impact" and the "proposed mitigation or compensation, if any, to the basin of origin by the applicant."[49]

As if that were not enough, state law provides that, unlike with other water transfers, water rights transferred between basins lose all their seniority. This so-called "junior-rights" provision means that the mere occurrence of an interbasin transfer will wipe out a significant portion of the value of underlying water right.[50] Unsurprisingly, interbasin transfers have not been common in Texas.

Texas should repeal the junior-rights provision and pare back the regulatory approval process to narrowly focus on environmental impacts rather than vague and subjective economic factors that will likely be positive for voluntary transactions in any case.

47. Neb. Rev. Stat. § 46-291; 457 Neb. Admin. Code, Ch. 9 § 001.

48. "Socioeconomic Analysis of Selected Interbasin Transfers in Texas," R.W. Beck, November 2006. http://www.twdb.texas.gov/publications/reports/contracted_reports/doc/InterbasinTransfers_draft.pdf.

49. Texas Water Code 11.085.

50. Texas Water Code 11.085(s).

PREPARE FOR FLOODS AND STORMS

If realized, projected changes to weather and climate patterns in Texas over the coming decades will likely increase flooding risk. Warmer air is able to hold more water, meaning that some areas will experience longer periods with little rainfall punctuated by periods of heavy rains and flooding. Extreme rainfall events are estimated to have increased between 20 and 40 percent in Texas over the past century, with the highest record for monthly rainfall occurring in May 2015 at the end of one of the state's most severe droughts.[51]

The Texas Gulf Coast faces its own unique risks. Throughout the state's history, the Gulf Coast has periodically been battered by hurricanes and other extreme weather events. Such storms are projected to grow more powerful—if not more frequent—in coming decades.[52]

Texas' insurance industry plays a critical role in managing and mitigating this risk. For obvious reasons, the insurance industry has been a leader in attempting to quantify the risks and costs of a warming planet, especially as it relates to floods, sea level rises and hurricanes. The financial industry is adapting to the physical hazards associated with climate change.[53] However, changing weather is not the only factor behind increasing storm damage. As the Intergovernmental Panel on Climate Change itself concluded when looking at this issue, "economic growth, including greater concentrations of people and wealth in periled areas and rising insurance penetration, is the most important driver of increasing losses."[54]

These factors are exacerbated by government programs that distort normal economic incentives to minimize risk and impede the flow of capital. Government provision of insurance and direct subsidies in the insurance market are prominent vehicles to socialize risk. Other instruments that create subsidies across insured categories with different risk profiles can have similar distortions. For example, governments have a historical record of socializing costs by restricting rate differences between high- and low-risk insured parties.[55] Such practices mute the magnitude and granularity of insurance price signals that accurately reflect climate risk.

The global property/casualty insurance and reinsurance industry remains well capitalized to absorb the risk of extreme weather, having $2 trillion of capital at the end of 2018.[56] When it comes to floods and storms, however, a large fraction of risk has been shifted away from these industries and onto governmental insurance entities. These entities include the federal National Flood Insurance Program (NFIP), which offers below-market-rate flood insurance in parts of the country, and the Texas Windstorm Insurance Association (TWIA), which offers below-market-rate storm insurance in designated counties along the Texas coast. Of note, state regulation of insurance rates often serves to suppress such signals, while post-hoc federal disaster assistance can create moral hazards that blunt incentives for state and local governments to invest in mitigation.

Climate change will only increase the harms of policies that cause misalignment of risk incentives, which will have the perverse effect of leaving society more exposed to climate damages. Much of this stems from the moral hazard caused by the socialization of risk, whereby insured individuals do not bear the full consequences of their actions and thereby lack incentive for managing risk.[57]

To minimize the harms from moral hazard, Texas should take the following actions.

Put TWIA and NFIP on sounder financial footing

TWIA is an insurance provider created by the Texas Legislature in 1971 to provide windstorm and hail insurance for residential and commercial properties in certain coastal areas of the state. The applicable statute (Chapter 2210 of the Insurance Code) lists 14 "first-tier" coastal counties and 14 "second-tier" counties. TWIA's current coverage area is all first-tier counties and a portion of Harris County, which is a second-tier county.

The Legislature created TWIA in 1971 in response to market conditions in the aftermath of Hurricane Celia. Its purpose is to serve as an insurer of last resort; it provides insurance only to those who are unable to obtain insurance in the private market, and it is prohibited from acting as a direct competitor to private insurance companies. Over time, the number of issued policies has grown, and between 2004 and 2014, the

51. Kate Wythe "Extremely Expected: Extreme is the new (and old) normal in Texas weather," Texas Water Resources Institute, 2016. http://twri.tamu.edu/publications/txh2o/fall-2016/extremely-expected.

52. John Nielsen-Gammon et al. https://climatexas.tamu.edu/files/ClimateReport-1900to2036-2021Update.

53. See, e.g., "First-of-its-kind Curriculum Will Focus on Climate Risk and Investment Research," Earth Institute, Sept. 11, 2019. https://blogs.ei.columbia.edu/2019/09/11/earth-institute-alliancebernstein-unveil-first-kind-climate-risk-investment-research-curriculum.

54. "Fifth Assessment Report: Key Economic Sectors and Services," Intergovernmental Panel on Climate Change, February 2018. https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap10_FINAL.pdf.

55. Dwight K. Bartlett et al., "Attempts to Socialize Insurance Costs in Voluntary Insurance Markets: The Historical Record," *Journal of Insurance Regulation* 17 (1999), p. 478. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.492.5651&rep=rep1&type=pdf; Lucia Bevere, "sigma 2/2019: Secondary natural catastrophe risks on the front line," Swiss Re Institute, April 10, 2019. https://www.swissre.com/institute/research/sigma-research/sigma-2019-02.html.

56. Ibid.

57. Richard Arnott and Joseph Stiglitz, "The Welfare Economics of Moral Hazard" National Bureau of Economic Research, 1990, pp. 91-121. https://www.nber.org/papers/w3316.pdf.

number of TWIA policies nearly tripled, reaching 275,000 policies at its peak in 2014.[58]

The growth in TWIA policies is directly related to TWIA's rates. TWIA has historically charged rates below an actuarially sound level; that is, below what is projected to be necessary over the long term for TWIA to meet its financial obligations. When funds from premiums are depleted, TWIA is allowed to call on a number of other funding mechanisms, including reinsurance and assessments made on private insurance companies operating in the state. TWIA does not receive general revenue from the state, and the state is not liable for any obligations TWIA issues. By its own admission, in 2021, TWIA's rates for residential customers were 39 percent below actuarially-sound levels and its rates for commercial customers were 45 percent below actuarially-sound levels.[59]

After Hurricane Ike helped bring attention to TWIA's poor fiscal health, a series of rate increases helped bring TWIA closer to balance. Rates for residential customers, which had been 32 percent below adequate levels in 2013, improved to 26 percent below adequate in 2016, and rates for commercial customers, which were 35 percent below adequate levels in 2012, improved to 22 percent below adequate in 2016.[60] However, since 2018, rate increases have stopped, and legislation passed in 2021 requires any future rate increases to receive two-thirds approval from TWIA's board.[61]

Similar problems bedevil the federal flood insurance program, NFIP. As with TWIA, NFIP was created about 50 years ago to provide a backstop for homeowners who could not find insurance on the private market.[62] As with TWIA, NFIP rates are below actuarially sound levels. And as with TWIA, this has led to a crowding out of the private market and to persistent fiscal problems with NFIP. Despite having $16 billion of its debt erased by Congress in 2017, NFIP was $20.5 billion in debt at the beginning of 2021.[63]

Absent reforms, these programs will continue to charge premiums that do not reflect the actual risks they bear. While TWIA currently satisfies its mandate of providing coverage for roughly $4 billion in claims, its under-reliance on premiums means that it must resort to issuing bonds and making assessments when severe storms strike. These financing mechanisms make future premiums more expensive and drive up insurance costs for consumers, and these risks are especially pronounced in the initial years following a severe storm. The same is true for NFIP, which is chronically in need of federal debt cancellations to keep it afloat. While a variety of mechanisms could bring these programs into long-term balance, the specifics are less important than the goal.

The Texas Legislature should make reforms to limit the risks from TWIA and slowly bring its finances into balance with its long-term actuarial needs. Reforms to the NFIP, of course, are beyond the direct ability of the Texas Legislature. However, Texas should urge Congress to reform NFIP and put it on sounder fiscal footing, as the organization's impediment to the development of the private flood insurance market poses long-term costs to the state.

CONCLUSION

As the discussion herein shows, there are many ways in which Texas could improve its emissions profile and become more resilient to extreme weather while simultaneously making the state freer, more prosperous and more economically dynamic. When topics such as climate change or the environment are raised in public discussion, conservatives—and in particular Texas conservatives—have the opportunity to effect positive change by enacting policies that will make the state stronger, cleaner and freer while reinforcing a limited and effective government and regulatory system.

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58. "TWIA Annual Report: June 1, 2020 – May 31, 2021," Texas Windstorm Insurance Association, June 1, 2021, p. 17. https://www.twia.org/wp-content/uploads/2021-TWIA-Annual-Report-and-CAT-Plan-Combined.pdf.

59. "2021 Rate Indications," Presentation by TWIA Actuarial & Underwriting Committee, July 21, 2021. https://www.twia.org/wp-content/uploads/Actuarial-and-Underwriting-Committee-Presentation-2021.pdf.

60. "Annual Report: June 1, 2020 - May 31, 2021," Texas Windstorm Insurance Association, June 1, 2021. https://www.twia.org/wp-content/uploads/2021-TWIA-Annual-Report-and-CAT-Plan-Combined.pdf.

61. SB 1448 (2021).

62. "The National Flood Insurance Act of 1968," codified at 42 U.S.C. 4001 et. seq.

63. "The Watermark: Fiscal Year 2021, First Quarter" Federal Emergency Management Agency, 2021, p. 2. https://www.fema.gov/sites/default/files/documents/fema_watermark-report_12-2020.pdf.