

# ONE

Only Natural Energy



## KlimaSeniorinnen



A few more  
Roads to Nowhere



Iran's gas resources  
in the Caspian Sea



Solar as an Asset Class in a  
High-interest rate Environment



Ecocide: should it be considered  
an international crime?





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- 4** KlimaSeniorinnen
- 6** A few more roads to nowhere
- 12** Iran's gas resources in the Caspian Sea
- 16** Locals at the mouth of the Amazon River get a salty taste of climate change
- 22** Apathy threatens the planet. How do we get people to care?
- 24** Solar as an asset class in a high-interest rate environment
- 26** Record heat, rising sea levels: The stakes for the climate couldn't be higher in 2024 elections
- 30** One small town plans for climate change
- 34** Ecocide: What is it and should it be considered an international crime?
- 36** Community opposition adds roadblocks to large renewables projects
- 40** Last stand: Argentiera



**Year X - Number 2**  
**APRIL-JUNE 2024**

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**Cover Photo:**  
Klimademo, Bern (Switzerland): "Don't blow it! Good planets are hard to find. KlimaSeniorinnen".  
Photo credit: Hadi

**Publisher:**  
Sotacarbo  
CO2 Technology Centre Sulcis  
Grande Miniera di Serbariu  
09013 Carbonia (Italy)

**Provider:**  
Aruba

Reg. Nr. 2/2014 Cagliari Ordinary Court

Only Natural Energy [ONE] is a digital magazine published every three months.  
<https://www.onlynaturalenergy.com>  
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The KlimaSeniorinnen.  
Photo credit: Womenforwiki



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# KlimaSeniorinnen

GIANNI SERRA

ONE

Climate change is increasingly a battleground. In the past, we had scientists versus negationists and corporations. From now on, it will be citizens against governments.

In 2016, 40 brave women in their sixties voiced their concerns about the Swiss government's lack of efforts to combat climate change. Initially overlooked, they took a bold step and sued the state for its inadequate climate policy. Their numbers grew steadily, and today, this group of determined activists, called 'KlimaSeniorinnen', includes nearly 2300 ladies.

Very little separates them from Greta Thunberg. Only age. It's no coincidence that in both cases, the 'climate revolt' started with women who did not accept the status quo. These are the persons who move society two steps forward.

Their legal action was met with scepticism, but they were undeterred. In 2020, the national Federal Supreme Court dismissed the case, and they resolved to take their fight to the European Court in Strasbourg. After four more years of perseverance, all the efforts were rewarded in April 2024, when the Court found that 'Switzerland failed to comply with its positive obligations under the Convention on Human Rights concerning climate change.' This landmark ruling is a beacon of hope for climate activists worldwide.

Now, we know that the convention's signatories have the duty to take all the necessary measures to shield their citizens from extreme weather consequences. Climate change science is rarely disputed anymore. This is evidenced by various observations of changes occurring in our natural world. And you do not even need a scientist to support the argument.

This is a decision that will make history and jurisprudence. The European Convention on Human Rights was signed by 46 countries. The impact of this ruling goes far beyond Switzerland, as it sets a precedent for all those countries.


Others will follow. There are already a few other pending climate change cases in Strasbourg. The "KlimaSeniorinnen" verdict is likely to be for the climate that the historic Bosman ruling was for football—a game-changer. **ONE**





Deer crossing the road.  
Photo credit:Chinmayisk





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# A few more roads to nowhere

LENORE HITCHLER

ONE

Burning fossil fuels to generate energy produces greenhouse gases that contribute to climate change. Unfortunately, burning fossil fuels also leads to other forms of ecological damage. For instance, the transportation industry is responsible for harming the environment, and roadways, in particular, endanger wildlife. For years, nature writers have discussed the negative effects of roads on nature. Thoreau stated, “Roads do some violence to Nature.” Aldo Leopold was considered the leader of the antiroad movement, and he asserted that “There is No God but Gasoline and Motor is His Prophet.”

One of the founders of conservation biology, Michael Soule, said that roads are “daggers thrust into the heart of nature.” By addressing the harmful effects of roads on wildlife, the climate change movement could reach potential allies such as animal and nature lovers. Road ecology is a relatively new science. Therefore, there are not yet enough facts available to thoroughly discuss how all wildlife is affected by roads. However, the length and breadth of roads demonstrate the extent to which they can damage wildlife habitats, thus putting many animals at risk for their very existence. Since it is virtually impossible to get a consensus on exact numbers, estimates must be used.

The lower 48 states (U.S. mainland) contain approximately four million miles of roads, and these roads impact most of the country. Richard Forman, Harvard professor, landscape ecologist, and a founder of road ecology, estimated that “22% of the U.S. mainland is estimated to be ecologically altered by the road



## Roads and road verges do provide habitat for some animals, particularly small mammals and insects and provide a source of food for carrion-feeders.

network.” An article in *Frontiers in Ecology and the Environment* added that 73% of the U.S. mainland is located within approximately 0.5 miles of a road of any type. Worldwide, there are vast networks of roads. For instance, both the Smithsonian and the BBC reported that worldwide there are a total of forty million miles of roads. Thus, the total land area that is impacted by roads is quite extensive. Of course, to be fair and honest, roads benefit a small number of animal species. For example, an article in the *Journal of Transport Geography* reported that “Roads and road verges do provide habitat for some animals, particularly small mammals and insects and provide a source of food for carrion-feeders.”

However, for the most part, wildlife is imperiled by both roads themselves and the climate change that is produced by road transport. Road transport is estimated to cause 15% of global carbon dioxide (CO<sub>2</sub>) production and 10% of total greenhouse gas emissions. Unfortunately, wildlife, along with their food sources, have evolved to thrive in their native weather patterns, and are frequently not able to adapt to rapid climate change.

The most obvious effect of roads on wildlife is the vast number of animals killed on roads. One estimate is that in the United States, one million vertebrates are killed every day. According to the U.S. Federal Highway Administration, the total number of motor vehicle accidents with large wildlife is estimated to be between one to two million every year. These are gruesome statistics but the number of deaths of pets on roads is even more heartbreaking to their owners.

Various sources estimate that 1.2 million dogs in the U.S. are killed yearly on roads. According to a news release from Indiana University, 5.4 million cats are hit by

cars in the country every year. Biologist Paul Donald, PhD. reported that in 1998, “Around 360 million birds, reptiles, amphibians and mammals die on the USA’s roads each year. A more recent study, published in 2014, suggested that the number of birds killed on the USA’s roads each year lies somewhere between 89 and 340 million. ... Across Europe, perhaps 200 million birds and 30 million mammals are killed annually on roads.”

Besides vertebrates killed on roads, invertebrates such as insects also perish in large numbers. Donald provided various estimates on the death tolls of insects. For instance, researchers reported that in Illinois, 20 million butterflies are killed every week. Another U.S. study found that approximately 35 dragonflies are killed daily per 0.6 miles of road. A Netherlands study estimated that over a trillion insects might be killed by traffic each year in that country. In addition to the large number of individual animals killed on roads, roads endanger the survival of many species. Roads lead to environmental fragmentation since many animals will not cross roads thus leading to smaller spatial environments. This has alarming consequences as many animal habitats are divided by roads.

According to an article in the *Annual Review of Ecology and Systematics*, “All roads serve as barriers or filters to some animal movement. ... The barrier effect tends to create metapopulations, e.g. where roads divide a continuous population into smaller, partially isolated local populations (subpopulations). Small populations fluctuate more widely over time and have a higher probability of extinction than do large populations.”

Donald stated, “By one estimate, major roads alone have carved the planet’s land surface into more than 600,000

tarmac-edged traffic islands, most of them further subdivided by smaller roads.” It is especially egregious that the areas with the most biological diversity are often bisected by roads. For instance, in the U.S., national parks, forests, and wildlife refuges contain more than half a million miles of roads. Road fragmentation of forests is quite extensive. Approximately 11% of all forest land in the U.S. mainland is located within 0.05 miles of a road according to an article in *Frontiers in Ecology and the Environment*. Global figures are similar. An article in *Science* reported that 70% of the world’s forests now occur within approximately 0.6 miles of a forest edge.”

Besides the harm caused by road-induced fragmentation of forests, wetlands are also endangered by roads. Wetlands are extremely important to the environment as they remove pollutants and are major sites of biological diversity. Unfortunately, the construction of roads leads to the loss of wetlands.

According to the U.S. Bureau of Transportation Statistics, between 310,000 and 570,000 acres of wetland were lost due to the construction of roads by the Federal Aid Highway Program between 1955 and 1980. The book *Road Ecology* reported that “Although wetlands constitute only 5% of the total land surface area in the USA, over a third of all rare and endangered animal species reside there. ... the species richness of birds, amphibians/reptiles, and plants was found to be negatively correlated to the density of paved roads around a wetland.”

Also, pollutants from roadways eventually wind up in wetlands endangering wildlife health. Road pollution endangers the health of many animals, starting with the roads themselves. Road surfaces erode which therefore releases pollutants into the environment. Motor vehicles

also produce pollutants. Road-based pollutants contribute to air pollution which then ends up on the ground leading to soil pollution.

These pollutants frequently circulate into waterways and eventually into the ocean. Thus, terrestrial and aquatic animals are endangered by breathing air pollutants, consuming polluted water, and eating plants that are contaminated by polluted soils. Carnivores consume even more toxins the further up they are on the food chain. Motor vehicle tires also release pollutants into the environment. Donald reported on the heavy toxic toll that tires place on the environment. One and a half trillion ultrafine particulates are produced approximately every 0.6 miles due to tire wear. Both particles from tire wear itself and road wear from tire friction are toxic pollutants and are possibly carcinogenic. Worldwide, approximately six million tonnes of microplastics from tire wear on roads are produced every year.

Estimates vary from 10% to 60% of all microplastics in the oceans come from tires. These toxins frequently end up within the bodies of wildlife thus imperiling their health. Besides writing about tires, Donald also reported about pollution from road salt. In the U.S., approximately twenty million tons of salt are spread on roads yearly. Worldwide, around sixty million tons are used every winter. If animals consume too much salt, their health is endangered. For example, Donald reported that “Frogs living near salted roads suffer from oedma, a bloating of the body caused by fluid retention, which restricts their mobility and reduces their lifespans. ... Salt also impacts frogs’ ability to survive the winter by reducing their natural anti-freeze, it makes them more vulnerable to diseases, it affects their immune systems, and in larval stages, it interferes with the functioning of the gills and leads to a higher rate of physical defects during development.”

**Persistent loud noise stresses wildlife. It can alter animal behavior, including communication, community structure, distribution, fitness, foraging mating, movement and reproduction. Noise can make some species more vulnerable to predators and cause wildlife to avoid certain areas.**



According to science writer Ben Goldfarb, “road salt (principally chloride) slows trout growth, makes frogs more susceptible to viruses, and ferments dead zones. Of course, other wildlife is also endangered by road salt. In addition to toxic air, soil, and water pollution caused by motor vehicles, traffic is a major source of noise pollution. Noise pollution increases environmental fragmentation and habitat loss. According to an article in the *Annual Review of Ecology and Systematics*, “Many possible reasons exist for the effects of traffic noise. Likely hypotheses include hearing loss, increase in stress hormones, altered behaviors, interference with communication during breeding activities, differential sensitivity to different frequencies, and deleterious effects on food supply or other habitat attributes.”

An article in *PHYS ORG* added that “Persistent loud noise stresses wildlife. It can alter animal behavior, including communication, community structure, distribution, fitness, foraging mating, movement and reproduction. Noise can make some species more vulnerable to predators and cause wildlife to avoid certain areas.”

Goldfarb added that “A mere three-decibel increase in background noise halves the ‘listening area,’ the space in which an animal can pick up a signal. By disturbing animals, noise also disrupts the ecological processes they catalyze, among them seed dispersal, pollination, and pest control.”

Birds are particularly vulnerable to noise pollution. According to an article in *Nature Ecology & Evolution*, “Studies of birds showed that noise levels from 23 to 93 dB [decibels] led to changes in abundance, species richness, community composition, physiology, reproduction, mating behaviours, vocalization characteristics, vigilance and foraging behaviours.”

Noise pollution contributes to the stress that birds face. Donald reported that “One of the first studies to show that traffic noise can elevate stress levels in birds was un-

dertaken in Gunnison National Forest, Colorado, where white-crowned sparrows nesting near a road were found to have higher concentrations of the stress hormone corticosterone in their blood than those nesting further away. ... The road in question was an unpaved track carrying only a few slow-moving vehicles each day. ... Another American study, this time of breeding tree swallows, found that exposing breeding birds to just six hours of artificial traffic noise every second day caused their chicks to grow more slowly and to be in worse health than those left in peace and quiet. This appears to be a common pattern; the stress caused to birds by even low levels of traffic noise results in a drop in the number of eggs laid and the health of the chicks that hatch. A study using data on over 100 bird species from across the USA has found that as traffic noise increases, so nesting success fails.”

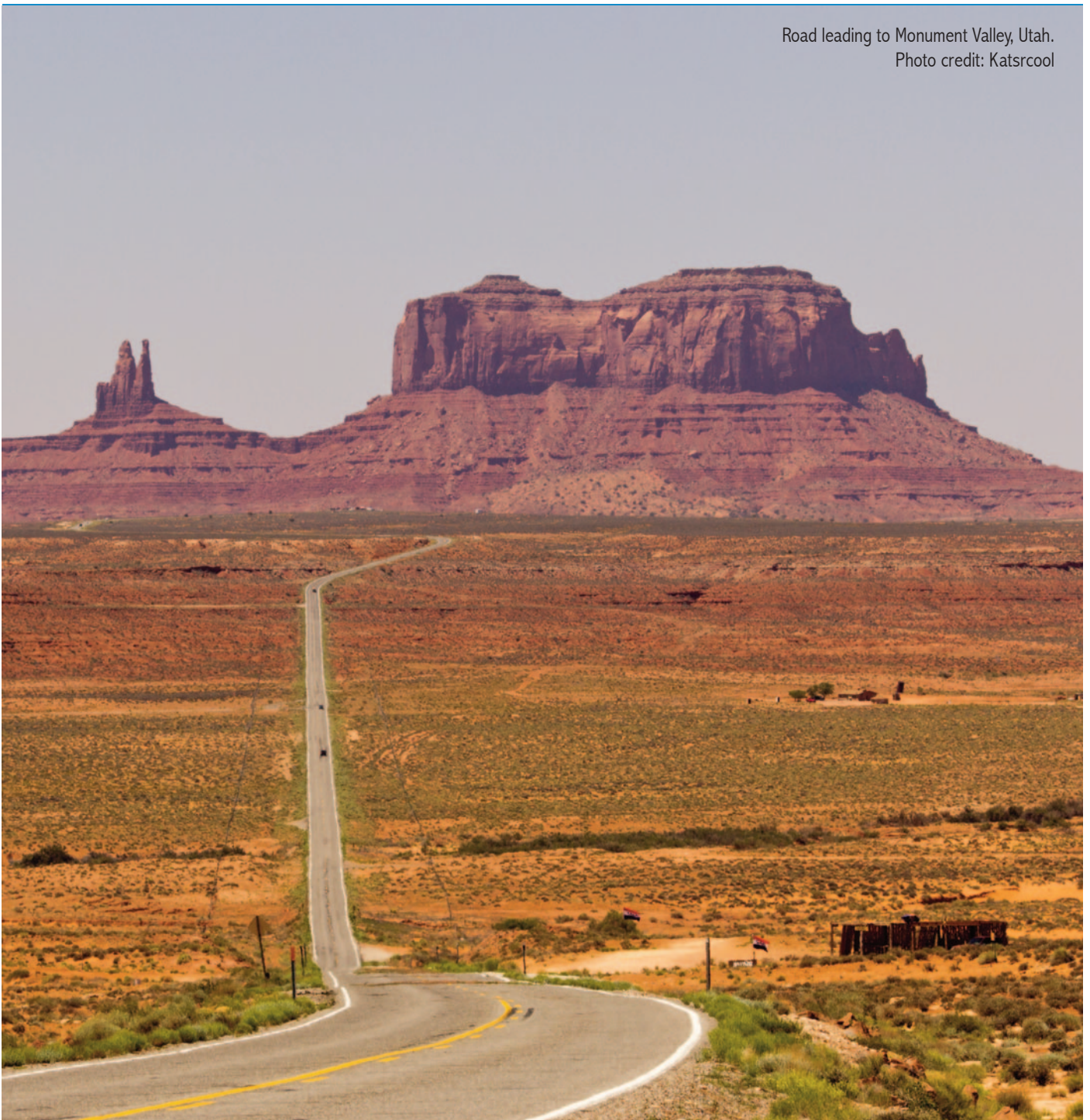
Of course, birds are only one of many types of animals that are imperiled by noise pollution.

Along with noise pollution, light pollution also endangers wildlife. An article in *Trends in Ecology and Evolution* reported that “Most organisms, including humans, have evolved molecular circadian clocks controlled by natural day-night cycles. These clocks play key roles in metabolism, growth and behavior. A substantial proportion of global biodiversity is nocturnal (30% of all vertebrates and 60% of all invertebrates.) ... Light pollution threatens biodiversity through changed night habits (such as reproduction and migration) of insects, amphibians, fish, birds, bats and other animals and it can disrupt plants by distorting their natural day-night cycle. Many insects actively congregate around light sources until they die of exhaustion. ... Migratory fish and birds can become confused by artificial lighting.”

Donald also stated that the global collapse of insect populations may be partly caused by light pollution that disrupts natural processes.

Light pollution is also life-threatening to even more animal species. An article in the *European Heart Journal*






reported that “In an animal study, constant illumination accelerated the onset of metabolic syndrome and spontaneous and chemically induced tumorigenesis, and shortened the life span in both male and female rats.”

Thus, roads endanger the health and the very existence of wildlife. The climate change movement can gain new adherents if they discuss these dangers with the special interest groups that already care about wildlife and those who generally care about nature.

Vegans and vegetarians, animal rights groups, birders,

and pet lovers might be moved to action. Hikers, cross-country skiers, campers, hunters, those who fish, and all other nature lovers are also potential allies.

Roads are not permanent because they deteriorate and then need to be resurfaced and restored.

The climate change movement could use the need for repetitive expensive repairs as an opportunity to advocate for replacing roads with more ecological and sustainable alternatives. Passenger and freight trains and public transportation could be re-established and expanded. 

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# Iran's gas resources in the Caspian Sea

## Situation, Tehran's view, opportunities and challenges, outlook

FARZAD RAMEZANI BONESH

ONE

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The Caspian Sea is in northwest Asia between Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan. Since the collapse of the Soviet Union in 1991, it has been of interest to Tehran with its potential oil and natural gas reserves.

The southern part of the Caspian Sea (Coast of Iran) is the deepest part of the sea, its depth is 1025 meters, while the average depth in this area is 300 meters.

Two decades ago, Iran, in cooperation with Shell and LASMO companies, conducted exploratory studies in the South Sea. Therefore, it found positive results in terms of the presence of rich hydrocarbon resources in the southern part of the deep waters of the Caspian Sea. 46 small and large structures, 8 blocks of which contain significant oil and gas reserves were identified.

The Khazar Exploration and Production Company (KEPCO) is responsible for the exploration, development, production, processing, and transportation of oil and gas in the South Caspian Sea basin and three coastal provinces of Iran.

By building a semi-floating drilling platform for exploration operations, and providing other infrastructures, Tehran has tried to conduct a complete exploratory study on the South Caspian (about 22% of the Caspian) and make discoveries in the last decade.

One of Iran's most well-known oil and gas fields in the Caspian Sea, Sardar-e Jangal Field was identified in May 2013, and according to some estimates, it has a gas reserve of 1.4 trillion cubic meters. Iran has also a common gas block with Azerbaijan, called "Alborz".

Chalous structure or gas field is also a gas field owned by Iran in the Caspian Sea, is the second-largest find in the Caspian Sea, completely located in the Iranian part of the sea.

Some estimates indicated that the gas reserves in the Chalus field have a total of 250 billion cubic meters of gas and can have a capacity of one-quarter of South Pars.

However, due to the lack of seismography in all





Caspian Sea from orbit. Photo credit: MODIS



## The discovery of new reserves in the Caspian Sea, in addition to determining and maintaining the share of hydrocarbon resources, plays a role in improving Iran's position in terms of hydrocarbon reserves in international forums.

areas and the unknown depth of the mines, it is impossible to express a reassuring opinion about the accuracy and economy of all sources. But there are also potential reservoirs of Nour, Royan, Ramsar and Rudsar, Gorgan, and other sources.

### Tehran's view

In addition to providing domestic consumption, Iran's gas strategy has pursued the export of more gas and exploration in the southern basin of the Caspian Sea and the three coastal provinces of Gilan, Golestan, and Mazandaran.

In the past years, Tehran put under consideration measures such as developing a comprehensive strategic plan and prioritizing structures, reviewing and updating information, developing the desired infrastructure for exploration operations, establishing a support base, conducting drilling, increasing regional cooperation with the Caspian Sea border countries in the fields of safety, environmental protection Life, signing several memorandums of understanding with domestic and international HSE-MS companies, and studying the development of Sardar Jangal field and exploratory blocks in South Caspian gas resources.

Also, the National Iranian Oil Company has not set the goal and priority of an immediate deadline for production from Iran's huge hydrocarbon resources in the Caspian Sea.

The discovery of new reserves in the Caspian Sea, in addition to determining and maintaining the share of hydrocarbon resources, plays a role in improving Iran's position in terms of hydrocarbon reserves in international forums.

With the special attention of the Iranian government, drilling and gas extraction studies have been underway. It seems that little by little the look at the production sector has also been strengthened.

At the end of December 2023, Petro Iran and KEPCO considered the feasibility study and transfer of hydrocarbons to the surface, checking the amount of gas produced, conducting long-term early production tests in the Sardar Jangal field, and developing priority blocks in the South Caspian basin.

In addition, referring to the principle of fairness and the agreements of 1921 and 1940 and the shape of the Caspian Sea in the south of this sea, Iran has continued negotiations with the countries surrounding the Caspian Sea to access the most rights in the sea.

Tehran also strongly opposes the reduction of its share in the Caspian Sea. In 2001, when Azerbaijan was trying to exploit the Alborz-Alovu field by BP, Iran intervened militarily and prevented the exploitation.

### Opportunities and challenges

Apart from the increase in national gas production, Iran exported 18.9 billion cubic meters of natural gas through pipelines in 2023, which is equivalent to 2.5% of the total global natural gas trade in that year.

Tehran plans to develop bilateral and multilateral relations with a focus on gas and in line with Iran's strategic approach to increase the production and export of natural gas (Iran's Vision Document) to



achieve an 8-10% share of gas trade in the region, Europe and Asia markets by 2025.

Iranian President Ebrahim Raisi said at the March 2024 meeting of the Gas Exporting Countries Assembly in Al Jazeera: "Iran is ready to become an energy pole and a safe route for the distribution and transit of natural gas between producers and consumer markets.

In 2023, Russia and Iran increased energy cooperation, and recently negotiations with Russian companies regarding contracts for the further development of oil and gas fields in Iran have reached the final stage. These contracts probably include Caspian gas resources.

The prospect of developing gas resources in northern Iran is also related to the strategic agreement between Iran and China. China may be willing to liquefy Caspian gas resources.

If the estimates are accurate and the continuation of the exploration of the Chalus structure is successful, it can be compared to the huge oil and gas fields in the south of Iran.

Even though the Turkmen, Azerbaijani, and Iranian sides have emphasized and agreed not to extract oil until their disputes are resolved, and there are negotiations and a general memorandum, there is no definitive agreement about Iran's share of the resources of the Caspian Sea. Therefore, there is still a long way to the final signing of the Caspian Sea Legal Regime Convention.

The role of the southern Caspian sub-base has not been clarified and it affects the extraction and export of gas in Iran. There are still doubts and disputes over the fields near the border between the countries.

Practically, the effectiveness of signing the Caspian Sea Legal Regime Convention depends on the effectiveness of bilateral negotiations between Tehran-Baku, Tehran-Ashgabad, Baku-Ashgabad, and the agreement between the countries surrounding the

Caspian Sea. In addition, Iran's coasts in the Caspian Sea are deep, and drilling and exploration are not economical and require expensive marine technology. So, despite the lack of financial resources, the costs will multiply.

Lack of connection with open waters, operational limitations related to equipment transportation, changing weather and climate conditions, very difficult support, special geological conditions, environmental risks of the Caspian, high risk of exploration operations, and anti-Iranian sanctions are among the main challenges for the development of gas fields by Tehran.


There are still ambiguities about the certainty of the existence of the reservoir, the estimation of the volume of the reservoir, and other technical and economic components in the southern part of the Caspian, and there is a need for appropriate evaluation studies and development plans. The exploratory excavation in the Chalus structure will take about two years.

## Outlook

Iran still has no income from Caspian gas and is the only country whose gas production in this region is zero. Iran's gas export volume is only 7% of the total domestic consumption.

Neglecting to invest in the development of Caspian gas fields may distance Iran from part of the global gas markets. Also, extensive exploitation of Iran's gas reserves depends on basic foreign investment and the use of modern technologies.

The Iranian fields of the Caspian Sea can become a new energy center and according to the new geopolitical developments, it has the potential to supply a more important part of the energy needs of Europe and other regions. Caspian gas also is a great opportunity for Iran to exploit its gas reserves and has the potential to increase Iran's global position and reach the first rank in the global gas market.

Caspian gas can provide an opportunity for Iran to diversify its exports and play a greater role in the energy markets of the region. 

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# Locals at the mouth of the Amazon River get a salty taste of climate change

RODRIGO PEDROSO  
Mongabay

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From the balcony of his two-story wooden house, Aurélio Marques gazes out over the Amazon River, flowing like a mere thread. The middle-aged boat pilot calculates how long it will take for the tide from the Atlantic Ocean to reach the riverbed, increasing the water level and allowing him to navigate to a nearby community with his boat.

“It seems that nature is revolting, angry with us,” Marques told Mongabay. “I’ve been reading nature since I was a child, but I am no longer able to decipher it.” Climate change, coupled with man-made actions in the Bailique Archipelago, a group of islands at the mouth of the Amazon River in the Brazilian Amazon, has changed the water cycle and made life increasingly arduous over the past four years.

Natural phenomena are becoming more aggressive and unpredictable, and Bailique’s residents, struggling to adapt to a new environment, are living now what people from other parts of the world will likely face in the future.

To the south of the archipelago, buffalo ranches and hydroelectric dams far away from the islands gradually diverted the course of creeks

and tributaries to the Amazon River. An enhanced river current is accelerating house-engulfing landslides on its riverbanks. It is also affecting the north, where the Amazon River and its tributaries are becoming weaker, silting up in part by the land being washed and dragged away from the south and leaving residents sometimes stranded.

As a result, water from the Atlantic Ocean, which itself is increasing its level, is infiltrating the islands from the north for a progressively longer period of the year, making the available water saline.

Broader changes in the Amazon are also playing a role. In past rainforest rainy seasons, temperatures were higher than usual, and the Amazon had one of the most severe dry seasons in 2023, enabling the worst drought ever registered on the Amazon River, helping the ocean to push back the mighty river farther into the continent.

The main economic crop of the archipelago, açai berries, is becoming salty due to the brackish water, and açai palm trees on the banks of the Amazon River are being devoured by fast-paced landslides.



Meanwhile, the Amapá state government and the municipality of Macapá, the state's capital that manages Bailique, are unable to mitigate the effects of the environmental changes, which have driven part of the population out of the archipelago.

Amapá's government estimated last year that roughly 13,000 people were living along the archipelago's eight islands, about 180 km (111.8 miles) and a 12-hour boat ride from Macapá. However, Brazil's official census from 2023 registered no more than 7,300 people living in Bailique.

"There's a lot of attention on the Amazon Rainforest, but little about its coast, which stretches from the state of Maranhão to Venezuela, being one of the most dynamic ecosystems in the world in terms of sensitivity to change," Valdenira Ferreira, a scholar from the Scientific Research Institute of Amapá State (IEPA) who has been researching Bailique for two decades, told Mongabay.

"We're talking about one of the most vulnerable areas on the continent, but the government is looking in the dark. There are no measurements or data beyond the superficial to draw up plans to adapt to these changes that are becoming more common each year," she said.

### **To the north: Wasps, drying rivers and salty waters**

Aurelio Marques, the boat driver who was calculating when the seawater would enter the riverbed in front of Livramento, a community founded by his father in the middle of the last century, says Bailique's residents are divided about what to do in this scenario.

His children went off to study and work in Macapá, Amapá's capital, but his elderly parents don't want to leave the place.

At the end of 2023, when Mongabay visited the area, Livramento was isolated from the outside world for a few hours a day. No boats could enter or leave it because of the Amazon River's drought, something that had never happened before — there are no roads to or into the archipelago. The dilemma about staying or leaving is boosted by the recent decline in living conditions. The community of Filadélfia, farther north of Livramento, endured the last seven months of 2023 without "really heavy" rain, as the residents say, necessary to endure an increasingly salty water river period.

"We've learned to catch rainwater and filter it," Francidalva Farias, a Filadélfia resident, told Mongabay while showing an improvised hose connecting her house roof rail to an open cistern covered with a blanket in her backyard. Almost every house in Bailique has three water tanks: one with saltwater, which they use for bathing and washing dishes, and two for fresh water, used for drinking and cooking.

"We use the first tank as a filter," Farias said. "When the dirt settles, we move it to the second one, which we can use to drink and cook. Because [the water from the river] is getting saltier and saltier. If it doesn't rain, we have no water to drink."

Walking around her community, a dozen sparse wooden houses connected by wooden walkways, Farias said she had never seen so many changes at the same time in the region, now heavily dependent on supplies from outside.

In December, only small boats, for a few hours a day, managed to navigate the low level of the river to get to the community. Due to the above-average heat registered in past winters, when rain was scarce, wasps became more aggressive, stinging residents more often and multiplying faster, to the point where they formed several colonies at the community's

school. “Going to school is becoming dangerous [due to the wasps]. And we have to save potable water as much as we can. When we bathe in saltwater, we get itchy. Children get mild burns [due to the saltwater]. The clothes have to be dried soon; otherwise, they smell bad. And the soap doesn’t lather like in the freshwater; it’s weird,” Farias said.

Some families manage to buy potable water from Macapá, but others have to go through the salinization of the water period — it has been up to eight months a year in the north of the archipelago — exclusively with the water collected from rain. When it runs out, they have no choice but to drink the salty water.

“Saltwater intrusion is happening all along the mouth of the Amazon River, as is coastal erosion,” Ferreira said. “Both have to do with rising sea levels and changes in the Amazon River Basin. If the discharge of water at the mouth decreases, the sea advances further. If sediment loads increase along the rivers due to deforestation, for example, more dirt is carried to the Amazon’s mouth, which in turn increases siltation.”

## **Diseases and governmental negligence**

Luiz Velázquez Tito, a Cuban doctor who worked in seven countries before settling in Brazil, reports that diarrhea, skin diseases and parasites are the most common health issues in the archipelago.

Tito arrived in the north of the islands in the middle of last year and, living in a room in a wooden house with no home appliances or even a bed, complains that the state government and Macapá City Hall have not offered him a suitable health structure or basic medicine. Tito is the first doctor to work in the north in eight years.

“They threw me here and left,” he told Mongabay while sitting on a worn-out plastic chair, the only furniture in his house. “I work in a room where I had to improvise a curtain as a wall between the triage, patients waiting and my medical care. I’ve worked in Angola, Venezuela and Haiti, but this is the place with the

most adverse working conditions. I’ve never seen so many recurring problems, especially because of the water,” Tito said.

The salinization of the archipelago’s waters once was a rare phenomenon restricted to the north of the islands, the elders who spoke with Mongabay recalled, happening once every few decades as a result of a severe drought in the Amazon River.

The deforestation of the Amazon, the general temperature rise in the region and the warming of the oceans have made the cycle of floods and droughts of the world’s largest river increasingly extreme.

But Amapá’s Water and Sewage Company, responsible for Bailique water supply management, started dealing with the periodic salinization of the archipelago only in 2023 when it provided desalination plants in the archipelago’s main community of Vila Progresso.

Developed for a different environment, it didn’t work due to the level of saltiness and sediments of Bailique’s water, greater than the machines were able to filter.

According to the company, a study is being carried out to measure the current level of salinization and residues. New plants, more suited to the local conditions, are expected to be placed in several communities by the end of the year.

Meanwhile, Macapá City Hall spent the second half of 2023 sending drinking water from the capital city in boatloads or in plastic bottles after declaring a state of emergency in the archipelago — which enables public officials to acquire services and goods with less bureaucracy and spending-proving control, among other things.

Some of Bailique families received nothing more than a pack with six 1.5-liter (0.4-gallon) bottles as boats stranded on riverbanks due to the drought.

The state government and Macapá’s mayor were questioned by Mongabay about the water



supply, the abandonment of health facilities, and whether they have plans to mitigate the effects of changes in the archipelago's environment but received no response.

Valdenira Ferreira and other experts of IEPA are awaiting funding from the federal government to carry out a continued measurement of Bailique's salinization and erosion.

The fund was promised in July 2023 by the Ministry of Integration and Regional Development, led by Waldez Góes, who ran Amapá as governor for four terms.

"We've got no response so far [about when the government will send funds]. We need research funding because the current policies for Bailique are being made without precise and continuous measurements. It is all being done within an emergency frame, but what we are seeing is that these phenomena won't fade out in the upcoming years. Quite the contrary, actually," said Ferreira.

## To the south: Falling lands, swallowed houses

Like other residents, Erielson Pereira dos Santos doesn't rely on government aid to survive. He lives with his family in a house on the banks of the Amazon River in the southern part of the archipelago. About a decade ago, he began sustainably managing açai palm trees on his land.

Four years ago, however, the riverbank began to fall frequently, especially during the rainy season, taking away the palm trees and his livelihood with it. Just as Aurelio Marques looked at the dried-up river in front of his house, Santos sees his land being eaten away by a river with a stronger current day after day.

"I had 400 meters [1,312 feet] of planted açai trees, counting from the riverbank into the island," he told Mongabay. "Now I have less than 50 m [164 ft] left. By next year, all those açai palms will be gone."

Boat on the Amazon river.  
Photo credit: Paula Nardini (Pexels)



And on top of that, the açai berries will probably be salty on the next harvest, which didn't happen on this part of the island before," he said. If the water is salty at harvest time, the açai palm trees absorb the salt, changing the taste and making it harder to sell the crop. Santos is planting more açai trees as far from the riverbank as he can, hoping that the landslide phenomenon will decrease its intensity over the next few years. Otherwise, he plans to leave for Macapá with his family.

Some institutes and universities in the region are trying to monitor the phenomenon, but there are few studies about the scale of what is happening in Bailique. A 2018 report from IEPA calculated that in some communities, erosion ate 10 m (32.8 ft) of land from the riverbank that year. Santos estimates that the yearly landslide in his plot is now four times larger.

Amazonbai, an açai producers' cooperative, has been helping riverine people since 2017 to sustainably manage the archipelago's main economic activity. In 2022, they opened an açai processing plant in Macapá and started to sell the industrialized organic açai pulp to other parts of Brazil and the United States, England and France.

"We're worried about these changes," Amiraldo Picanço, president of Amazonbai agroindustry, told Mongabay by telephone. "We know that the ocean level is going to keep on rising, and it's certainly going to push the river a little further in and that we will have more extreme drought and floods in the Amazon River. It's a bit of a characteristic of the archipelago that the land falls in one place and appears in another, but what we have now is a maximized phenomenon combined with the pressure made by human activity."

Buffalos and dams, a worsening scenario  
About a 30-minute boat ride into the archipelago from the main community, a large river flows into the Amazon, resembling one of the many major tributaries of the world's largest river. It's the Araguari River, which runs in pa-

rallel with the Amazon River farther north and has been suffering from siltation. A boom of buffalo ranches that were spared on Amapá's mainland riverbanks in the past years, plus the construction of hydroelectric dams on the Araguari, damaged its flow to the Atlantic, creating a new course of water that runs to the Amazon River before getting into the sea.

Ten years ago, the Urucurituba River was a small creek feeding the mighty Amazon. Nowadays, it is a large and deep brownish river helping to accelerate land erosion in the south of the archipelago, according to experts and riverine people. The greater the erosion, the faster the houses on the riverbank are falling down. Açai farmer Erielson, for example, has already lost four houses in the last decade. A resident of the main village of Vila Progresso, with more than a thousand residents, said he has been living in his sixth house in the last eight years. As the land falls, residents move what they can of their wooden houses farther into the islands, but many communities are starting to get cornered by private-owned buffalo ranches. Some villages are disappearing.

"How can you invest on this island if you know that you can lose your house?" boat pilot Aurelio Marques told Mongabay, assessing the increasing unpredictability of the environment at the "dancing waters" archipelago, as its residents sometimes call it. He takes another look at the river and estimates that the sea tide shouldn't fill the riverbed in front of Livramento until dawn. The trip to the next community is postponed to the following day.

"I keep thinking: We're surrounded by the biggest river in the world, but we have to bring drinking water from the capital or move around as nomads," he said. "I'm going to wait for the next few years, but if it continues like this, I'm going to sell my boat. I wouldn't like to, but I'll have to leave."

*Originally published  
by Mongabay  
February 26, 2024*



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# Apathy Threatens the Planet. How Do We Get People to Care?

**New research backs up conventional wisdom  
that getting people outdoors inspires them to conserve nature**

DAVID SHIFFMAN

The Revelator

Birdwatching at the "Parco dei Lagoni", Arona (Novara, Italy). Photo credit: Dodo

The natural world faces many threats, but to many environmentalists, none are so baffling and heartbreaking as public apathy toward those threats.

How do we get more people to care about the natural world so they're moved to stand up and defend it? The answer is complex, of course, because humans are complex. But part of it can be found in a simple truth: Some people don't care much about the natural world because they haven't experienced nature directly.

For years experts have pointed to a potential solution: Getting people to spend more time in nature, they say, can help make them care more about threats to our environment and adopt more pro-environment behaviors.

Does this popular wisdom work? A new study synthesizes the evidence from a dozen other studies and finds there's some truth to it.

"Personal contact with nature, especially at an early age, can strengthen an individual's emotional affinity to it, facilitating their motivation to adopt pro-nature

behaviors," says ecologist Masashi Soga, the study's lead author and an associate professor at the University of Tokyo.

According to the research, more time in nature results in caring more about nature and, therefore, being more willing to change behavior to promote better conservation outcomes.

"Those who frequently experience nature are more likely to recognize ... environmental decline in their surroundings," Soga says by email. "This may, in turn, increase their motivation to contribute to mitigation efforts."

Specifically, Soga says, he and his fellow researchers found that "direct experiences with nature might increase altruistic and pro-social behavior, promoting environmentally sustainable behavior and decision-making."

The new analysis looked at studies from all over the world. Each looked at people's experiences, ranging from visiting parks in a city to birdwatching in a forest or participating in nature cleanups and organized



tree-plantings. A wide variety of pro-environment behaviors resulting from spending time in nature were measured by these studies, ranging from recycling (and not littering) to being more conscious about energy usage and driving less.

Across the board the studies showed that people who did more in nature were more willing to change their behavior to protect it.

“Enhancing people’s experiences with nature might be one approach to encouraging desired behavioral change to halt biodiversity loss,” Soga says. And conservation policy to stop extinctions, he says, “would likely benefit from expanding efforts to reconnect people to nature.”

Getting to that point, though, requires some effort.

## **How Do We Actually Get More People to Experience Nature?**

Early exposure to nature is especially important, but increasingly rare for kids born in urban areas. The University of Miami lab where I got my Ph.D., for example, took middle-school and high-school science classes out on shark-tagging expeditions, and I was always shocked at how many kids who lived an hour’s walk from the coast had never seen the ocean.

Fortunately some groups are working to change this, including one in the nation’s capital.

“Washington, DC, is a wonderful place with lots of nature nearby, but not all populations have the same access to it, so we’re working to expand that access,” says Dan Ebert, director of communications for the City Kids Wilderness Project.

City Kids takes children from the DC area to local hiking and rock-climbing events year-round, and to a ranch in Wyoming for summer camp. Students start in middle school and participate through high school, with older kids mentoring younger ones.

“We also incorporate conservation education into our trips,” Ebert says. “We see a lot that kids have a newfound appreciation for nature, they find themselves relaxing a lot more, and their anxiety is lower when they’re spending time in nature. Kids find

themselves in nature, and of course that translates to wanting to help conserve and protect it.”

But you don’t need to be a kid to experience nature for the first time and derive benefits from it. Another group that brings people out into nature is Black Girls Hike, which organizes events both for beginners and experienced adventurers.

“We do lots of outdoor activities like hiking, kayaking, birdwatching, and more with the goal of introducing Black girls to nature and destigmatizing what it means to be Black in nature,” says Black Girls Hike CEO and founder Asia Bright. “In our four years of existence, thousands of people around the world have joined us for some time in the great outdoors. Some peoples’ minds explode when they realize there are no skyscrapers in sight and no cell service!”

Bright agrees that spending more time in nature makes people think about conservation more. “The more people who can see the effects of what they do on nature, the more people who can see the state of the natural environment, the more people who can be awakened to caring about the environment and awareness of how their actions can cause harm,” she says.

## **Nature Is Where You Find It**

For both children and adults, Soga points out that “nature” doesn’t have to mean isolated pristine wilderness. We can bring nature closer to where people already are. “Many current policies focus on the creation and preservation of urban green spaces as a means to mitigate biodiversity loss,” he says. “But given the impact of peoples’ lifestyles and behaviors on biodiversity, our results suggest that these places can also help with biodiversity conservation by fostering connection between urban dwellers and the natural world.”

“People need to be outside more,” Bright tells me. “It’s about introducing people to the benefits of the outdoors and teaching them to care for the environment.”

*Originally published  
by The Revelator  
March 6, 2024*



# Solar as an asset class in a high-interest rate environment

ALICE MASILI  
ONE

*Patrick Donati is a renowned renewable energy expert and the founder of Terrawatt. Patrick shares insights on solar as an investment vehicle in this interview with Only Natural Energy.*

## **Terrawatt is one of the many spinoffs in the renewable energy business. How this company established in 2021 fits into the global international energy market?**

Terrawatt is working to become an independent power producer (IPP) active in Italy and abroad. Currently, we have a development pipeline of c. 200mw, which we are working on bringing to authorisation. We aim to expand this pipeline to c. 500mw over the coming years and begin to convert these projects into operational solar farms, which provide clean energy to local communities and businesses.

## **What are the most reliable solutions you offer?**

Terrawatt specialises in the development and construction of solar farms, which are an extremely dependable form of energy generation. Even with cloud cover, modern solar panels can generate energy from the available sunlight, and generally speaking, solar farms produce energy at the same time every day, with some fluctuations to account for seasonal shifts in sun hours. Furthermore, among all the benefits of solar panels, the energy produced does not require any additional emissions.

## **Is renewable energy a long-term financial investment?**

Absolutely. Solar and wind farms, hydro and biomass plants are classified as infrastructure assets with enduring and predictable cashflow profiles, making them excellent long-term investments. Once the renewable energy plant is built, it is expected to have a useful life of 20-30 years, with the poten-

tial for further extension through technological upgrades.

## **What do rising interest rates mean for renewable energy and for consumers?**

Interest rates and energy prices are very closely linked macroeconomic elements. Energy, as an essential commodity, exhibits high price inelasticity – meaning that as prices rise, the decrease in demand is less than proportionate. Therefore, when energy prices surge, they often fuel a broader increase in inflation since energy is a key input across various economic sectors. Interest rate rises usually follow suit, which tend to have the effect of tempering new investments in the economy and stabilising inflationary trends.

## **How do rising interest rates impact solar projects?**

Solar farms are typically built with a high leverage profile, which exposes their returns to fluctuations in interest rates. Resultantly the asset class is less attractive to potential investors, as interest payments and debt obligations constitute the number one cost components for solar farm operations.

## **What impact do they have on energy prices and the valuation of renewable energy? Do you think it is possible to mitigate this impact and how?**

Energy prices tend to be dictated by the market rather than by producers. As an energy producer, there is not much to differentiate you from another producer of the same type. We all produce the same watts! As interest rates rise, energy producers have their margins squeezed and valuations reduced. Given the nature of the market, it's difficult for renewable producers to increase their sale prices because other producers will be able to sell the same energy at a lower price.



**In the field of photovoltaics, the production market is controlled by China. In 2022, China accounted for 77.8 percent of the global photovoltaic (PV) module production. The country representing the second-largest share of PV production was Vietnam, accounting for just 6.4 percent. How does this impact the strategic decision for the European Green Deal and Europe's green future?**

That remains a difficult issue. Yes, China dominates the production of solar panels, and this is due to compelling reasons – China has the largest deposits of silicone, the key ingredient in solar cells, and has some of the best technology to produce solar panels. Europe is years behind in terms of the technology. Western producers of solar panels import Chinese cells and assemble them in Europe. Is it worthwhile to invest the billions required for the onshore production of solar panels? The picture is mixed.

**The reduction in solar energy prices is certainly a benefit for the consumer, but an excessive drop in prices could negatively impact the producers. Is that a real threat? And how can you counter that?**

Lowering energy prices is, counterintuitively, our goal as renewable energy producers. As we put more cost-effective energy into the market and reduce our country's dependence on fossil fuel imports, the price of energy will inevitably decrease. Crucially, energy prices will become less volatile as onshoring our energy production reduces our exposure to geopolitical risks. From our perspective as producers, we try to fix our sale price for several years using Power Purchase Agreements – essentially long-term sale contracts of a quantity of energy at a fixed price.

**In your opinion, is the production of 100% renewable energy possible on a global scale? And how?**

Achieving that goal is paramount. But this won't be possible with just solar and wind. Renewable energy sources harnessing natural resources are inherently unreliable – solar energy fluctuates with daylight availability, wind power hinges on wind patterns, and even hydroelectric sources can be affected by changing water levels worldwide. For a resilient electric grid, supply must constantly match demand to prevent blackouts and system damage. Hence, there's a crucial need for stable, on-demand energy production to meet this fluctuating demand. One solution lies in utility-scale storage, allowing excess renewable energy to be stored during surplus periods and deployed when demand peaks. Another essential component for comprehensive decarbonisation of the grid is nuclear energy.

**You operate in Italy. Do you think the nuclear power is still an option for country who voted against it twice with an overwhelming majority?**

You said it yourself. Italians voted twice, in an overwhelming

Patrick Donati is a renewable energy entrepreneur and expert in green technology and sustainable development, with an extensive background in renewable energy and infrastructure finance.

In 2021, at a pivotal time for the energy industry, he co-founded Terrawatt, an independent power producer that operates in the Italian market, stemming from the diversification of Donati S.p.A.

The company's vision is to play a part in aiding the transition to clean energy and creating a world where economic growth serves all.

Patrick champions the use of responsible investment and finance as a social vehicle to foster positive change, the premise on which Terrawatt was born. His mission is to increase access to renewable energy solutions, enabling local communities, businesses, and governments to embrace a more environmentally friendly future.



Photo credit: Patrick Donati

majority, against nuclear. Unless a large and concerted marketing effort is undertaken prior to the vote, it is unlikely the Italian population will accept nuclear plants on our territory. In addition, the timescales for nuclear construction, coupled with Italy's difficulty with seeing through large scale infrastructure projects, makes nuclear even less likely to be realized. Certainly not by 2030!

**In your opinion which other forms of energy could help accelerate the energy transition on a global scale?**

The current push globally to install as much wind and solar power as possible is currently the correct approach.

Though bureaucratically slow, solar and wind are extremely efficient to roll out from a technical perspective, given the maturity of the hardware. For example, a utility-scale solar farm can take less than two weeks to build.

Wind farms are similarly quick to construct, taking 2-4 months just for the installation. However, as I mentioned previously, these cannot be the panacea to our emissions problem.

While we attain the "low-hanging fruit", we need to start planning for the next phase, which implies the deployment of constant clean energy technologies, such as nuclear, to achieve an emissions pathway consistent with 1.5 degrees of global warming, as envisioned by the Paris Agreement on climate change. **ONE**

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# Record Heat, Rising Sea Levels: The Stakes for the Climate Couldn't Be Higher in 2024 Elections

From Biden vs. Trump to an oil well referendum in California, climate change debate is all over the ballot in federal, state and local contests.

MARCUS BARAM

Capital & Main

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In the wake of the hottest year on record, with fossil fuel production increasing and sea levels rising, the stakes for the climate couldn't be higher in this year's elections.

In the presidential contest, the contrast is distinct. President Joe Biden's massive climate initiatives and tougher environmental regulations are sure to drive turnout on both sides of the political aisle. And likely Republican nominee Donald Trump's promises to pull the country out of the Paris climate accord again, aggressively "drill baby drill" and repeal the Inflation Reduction Act are making headlines.

In previous election cycles, climate change was typically low on the list of voters' concerns and largely ignored by the candidates. But it was a powerful predictor of voters' behavior — helping boost Democrats in recent elections, according to a new study. Climate change likely cost Republicans the 2020 election, according to researchers at the Univer-

sity of Colorado Boulder Center for Environmental Futures, helping pull Democrats, independents, moderate Republicans and younger voters to the polls.

The differences between the parties have grown even more stark in recent years. Back in 2008, then-Democratic Speaker of the House Nancy Pelosi and former Republican Speaker Newt Gingrich sat on a couch outside the U.S. Capitol for a TV ad. "We don't always see eye to eye," Pelosi said, to which Gingrich replied, "But we do agree our country must take action to address climate change."

Times have changed. Now, according to a recent Pew Research Center poll, 78% of Democrats view climate change as a major threat, compared to only 23% of Republicans.

Nathaniel Stinnett, founder of the Environmental Voter Project, is hopeful those numbers will play out on the campaign trail. "The question is: Will that lead to climate debates in the elections, more and more climate messaging from





the campaign?”

Stinnett’s group is overwhelmingly targeting young voters, one of the few demographics for whom climate has been an overriding issue. “Climate action is going to be a top issue for young voters given that we are inheriting a world that has been ravaged by greedy companies and worsening weather disasters,” said Jack Lobel, a Columbia University student and spokesperson for Voters of Tomorrow, which seeks to mobilize young voters.

The second-most climate-concerned age demographic is at the other end of the spectrum – older people, many of whom have seen the effects of climate change during their lifetimes and who have decades of experience with activism. Older people, who vote in greater numbers than young people, are three times as likely to list climate as a top priority than middle-aged people, Stinnett said.

The Biden administration has now gone on the offensive. At a Jan. 30 reception in Jupiter, Florida, the president told supporters: “We’re saving the planet with the most significant investment in climate change ever anywhere in the history of the world – literally anywhere.” He added a dark warning: “Now imagine the nightmare if Trump is returned to office.”

There might be cause for such dramatic language. Biden’s climate agenda is a key target of conservative activists, including those at The Heritage Foundation, which recently released a 900-page blueprint titled “Project 2025” for a future Trump administration. Among its proposals: Reduce the role of the U.S. Global Change Research Program, the decades-old initiative that first alerted the world to the depletion of the ozone layer in the 1990s, and replace the White House climate adviser with an energy/environment adviser who would coordinate policy with the oil and gas in-

dustry. Fossil fuel producers and renewable energy interests alike are spending millions in campaign contributions and ad campaigns to influence voters. Oil and gas interests contributed at least \$8.3 million to Trump's reelection in the last half of 2023, while the country's biggest fossil fuel industry group, the American Petroleum Institute, is launching an eight-figure ad campaign to urge voters to dismantle much of Biden's climate agenda.

Meanwhile, the advocacy group Climate Power has vowed to spend \$80 million to promote Biden's climate policy and clean energy accomplishments, while the Holdfast Collective, a group of nonprofit groups created and funded by outdoor apparel company Patagonia, has already doled out around \$71 million to climate-focused causes. While the presidential contest is sucking up most of the oxygen, there are other federal races that will have an effect on climate policy. In Arizona, U.S. Senate candidate Kari Lake, the MAGA celebrity who lost the 2022 gubernatorial race, has dismissed concerns about climate change. Last summer, when a brutal record-breaking heat wave devastated the state, her campaign accused Democratic Gov. Katie Hobbs and Democratic Senate contender Ruben Gallego of "pushing mass hysteria in an effort to declare a climate emergency" and blamed heat-related deaths on "the meth their policies allow to flow freely on our streets."

The state's current senator, Kyrsten Sinema, an independent who has not declared whether she will seek reelection, supported Biden's climate initiatives but has angered environmentalists with some industry-friendly stances, such as easing requirements for renewable energy sources to plug into the electrical grid.

In Montana, where climate change has reduced agricultural yields and increased wildfires, Democratic Sen. Jon Tester, one of the Senate's only working farmers, was called an "unlikely champion for climate action" by The Washington Post because of his support for efforts to reduce fossil fuel emissions and speed up the transition to clean energy. His likely Republican opponent, businessman and combat veteran Tim Sheehy, has expressed support for international efforts to combat climate change but has changed his tune since launching his campaign – telling Fox News that "the

cleanest form of energy known to man is American fossil fuels" and removing climate change references from his company's website.

Even in red states, climate change is driving candidates. In Utah, a traditional GOP stronghold, Republican U.S. Rep. Jon Curtis is running for the Senate seat being vacated by Mitt Romney with a strong climate agenda. The founder of the House of Representatives' Conservative Climate Caucus, Curtis is an outlier in his party, taking global warming seriously and saying that it's partly the GOP's "fault that climate change is so politically polarized." On the Democratic side, one of the leading contenders is climate activist and mountain climber Caroline Gleich, a social media celebrity who plans to focus on "social and environmental justice."

Beyond the headline-making races, there are consequential elections in state legislatures and local communities that will affect policy in some of the highest-climate-risk states, such as Florida, South Carolina, Georgia and Texas, where voters are affected by local climate issues, such as what energy sources they use, how energy efficient their buildings are and what protection they have against wildfires or floods. In states such as California, there are climate-related referendums on the ballot. When California passed a law mandating setbacks between oil wells and local communities, the petroleum industry and its political allies spent more than \$20 million to put a referendum on the November ballot that could gut the law. The outcome of this expensive battle – the Campaign for a Safe and Healthy California is raising \$2.3 million to keep the law – could have repercussions for decades to come.

We can not predict the outcome of the fall elections, but there is no doubt among scientists that immediate and transformative action is our only hope against a future of cataclysmic weather, mass migration and wars caused by our destabilized environment. As time runs out, it is candidates and voters who will determine if we step up to the challenge.

*Originally published  
by Capital & Main  
February 27, 2024*






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# One Small Town Plans for Climate Change

**Among rural communities, Grants Pass, Oregon, has notched an unlikely win. But limited resources threaten their sustainability plan's success**

CLAIRE CARLSON  
Nexus Media News

Grants Pass Oregon. Photo credit: Nicolas

One of the most iconic landmarks in downtown Grants Pass, Oregon, is a 100-year-old sign that arcs over the main street with the phrase “It’s the Climate” scrawled across it.

To an outsider, it’s an odd slogan in this rural region, where comments about the climate – or rather, climate change – can be met with apprehension. But for locals, it’s a nod to an era when the “climate” only referred to Grants Pass’ warm, dry summers and mild winters when snow coats the surrounding mountains but rarely touches down in the city streets.

Now, the slogan takes on a different meaning.

In May 2023, the Grants Pass City Council passed a one-of-a-kind sustainability plan that, if implemented, would transition publicly owned buildings and vehicles to renewable energy, diversifying their power sources in case of natural disaster.

While passing the sustainability plan in this largely Republican county was an enormous feat on its own, actually paying for the energy projects proves to be Grants Pass’s biggest challenge yet.

“There are grants out there, but I don’t think we’re the only community out there looking for grants to help pay for some of these things,” said JC Rowley, finance director for the city of Grants Pass. Some project examples outlined in their sustainability plan include installing electric vehicle charging stations downtown and solar panels at two city-owned landfills, and converting park streetlights to LED.

Rural communities face bigger hurdles when accessing grant funding because they don’t have the staff or budget that cities often do to produce competitive grant applications. This can slow down the implementation of projects like the ones laid out in the Grants Pass sustainability plan.

And time is not something Grants Pass – or any other community – has to spare. Global climate models show the planet’s average annual temperature increasing by about 6.3° Fahrenheit by 2100 if “business-as-usual” practices continue.

These practices mean no substantive climate change mitigation policy, continued population growth, and unabated greenhouse gas emis-



sions throughout the 21st century – practices driven by the most resource-consumptive countries, namely, the United States.

In southwest Oregon, this temperature increase means hotter summers and less snow in the winters, affecting the region’s water resources, according to a U.S. Forest Service analysis. This could mean longer and more severe wildfire seasons.

In Roseburg, Oregon, about 70 miles north of Grants Pass, a 6.3°F increase would mean the city’s yearly average of 36 days of below-freezing temperatures would decrease to few or none, according to the analysis. Grants Pass would suffer a similar fate, drastically changing the climate it’s so famous for.

Grants Pass has a population of 39,000 and is the hub of one of the smallest metropolitan statistical areas in the U.S. The metro contains just one county, Josephine, which has a population of under 90,000, nearly half of whom live outside urbanized areas. Over half of the county’s land is owned by the Bureau of Land Management or National Forest, and it contains a section of the federal Rogue River Scenic Waterway.

“In the event of a natural disaster, we are far more likely to get isolated,” said Allegra Starr, an Americorps employee who was the driving force behind the Grants Pass sustainability plan. “I’ve heard stories of communities that were less isolated than us running out of fuel [during power outages].”

Building resilience in the face of disaster is a main priority of the plan, which recommends 14 projects related to green energy, waste disposal, transportation, and tree plantings in city limits. All of the projects focus on improvements to city-owned buildings, vehicles, and operations.

In partnership with Starr and the Grants Pass public works department, a volunteer task force of community members spent one year researching and writing the sustainability plan. In spring 2023, it was approved by the Grants Pass City Council.

Now, the public works department is in the grants-seeking stage, and they stand to benefit from the influx of climate cash currently coming from the federal government.

### **Money for Sustainability, If You Can Get It**

In 2022, the Biden administration passed the single largest bill on clean energy and climate action in U.S. history: the Inflation Reduction Act, which funnels \$145 billion to renewable energy and climate action programs. The Bipartisan Infrastructure Law, passed in 2021, allocates \$57.9 billion to clean energy and power projects.

“It’s almost like drinking through a fire hose with the grant opportunities, which is a curse and a blessing,” said Vanessa Ogier, Grants Pass city council member. Ogier joined the council in 2021 with environmental and social issues as her top priority and was one of the sustainability plan’s biggest proponents. But competing against larger communities for the grants funded through these federal laws is a struggle for smaller communities like Grants Pass.

“I really don’t want to look a gift horse in the mouth, but when a small community only has one grant writer and they have to focus on water systems, fire, dispatch, fleet services, and they’re torn in all these different ways, it can be difficult to wrangle and organize all these opportunities and filter if they’re applicable, if we would even qualify,” Ogier said.

Having a designated grant-writing team, which is common in larger cities, would be a huge help in Grants Pass, Ogier said. A 2023 study by Headwaters Economics found that lower-capacity communities – ones with fewer staff and limited funding – were unable to compete against higher-capacity, typically urban communities with resources devoted to writing competitive grant applications.

“[There are] rural communities that don’t have community development, that don’t have economic development, that don’t have grant writers, that may only have one or two paid staff,”



said Karen Chase, senior manager for community strategy at Energy Trust, an Oregon-based nonprofit that helps people transition their homes and businesses to renewable energy. Chase was a member of the volunteer task force that put together the Grants Pass sustainability plan.

When the Inflation Reduction Act money started rolling in, many of the rural communities Chase works with did not have plans that laid out “shovel-ready” energy and climate resiliency projects, which is a requirement of much of the funding. Grants Pass’ sustainability plan should give them a leg-up when applying for grants that require shovel-ready projects, according to Chase.

“Most of my rural communities pretty much lost out,” she said.

This is despite the approximately \$87 billion of Inflation Reduction Act money classified as rural-relevant, rural-stipulated, or rural-exclusive funding, according to an analysis from the Brookings Institute. Rural outreach is part of the Biden administration’s larger goal to put money into rural communities that historically have been left out by state and federal investments.

But this outreach isn’t perfect. Most of the federal grants available to rural communities still have match requirements, which are a set

amount of money awardees must contribute to a grant-funded project.

The Brookings Institute analysis, which also looked at rural funding from the Infrastructure Investment and Jobs Act and the CHIPS and Science Act, found that “over half [of the rural-significant grants programs] require or show a preference for matching funds, and less than one-third offer flexibility or a waiver.”

Of the rural-exclusive and rural-stipulated programs, less than one-third of the total grants offer match waivers or flexibility to reduce the match requirement. This makes getting those grants a lot harder for rural communities with smaller budgets.

### **Help From the Outside**

To address limited staffing, in 2021 the Grants Pass public works department applied to be a host site for an AmeriCorps program run out of the University of Oregon. The program, coined the Resource Assistance for Rural Environments (RARE) program, assigns graduate students to rural Oregon communities for 11 months to work on economic development, sustainability planning, and food systems initiatives. An AmeriCorps member was assigned to Grants Pass to work as a sustainability planner from September 2022 to August 2023.

Without the AmeriCorps member, Grants Pass officials say there’s no way the plan would have





been written. “She came in and learned about the city and the operations and the technical aspects of it and was able to really understand it and talk about that,” said Kyrrha Sevco, business operations supervisor for the public works department. “That’s hard to do.”

Bringing outsiders in can be a tricky undertaking in a rural community, but RARE program director Titus Tomlinson said they collaborate with the host sites to make the transition for their members as smooth as possible.

“When we place a member, we place them with a trusted entity in a rural community,” Tomlinson said. “[The site supervisor] helps them meet and engage with other leaders in the community so that they’ve got some ground to stand on right out of the gate.”

Each participating community must provide a \$25,000 cash match that goes toward the approximately \$50,000 needed to pay, train, and mentor the Americorps member, according to the RARE website. Communities struggling to meet this cash match are eligible for financial assistance. Grants Pass paid \$18,500 for their portion of the RARE Americorps grant.

Allegra Starr, the Americorps employee, no longer works in Grants Pass since completing her 11-month term. In her stead, a committee of

seven has been created to monitor and report to the city council on the progress of the plan’s implementation.

Much of this implementation work will fall on the director of the public works department, Jason Canady, and the business operations supervisor, Kyrrha Sevco. “There has to be that departmental person who’s really carrying that lift and that load,” said Rowley, the Grants Pass finance director. “It’s the Kyrrhas and Jasons of the world who are leading the charge for their own department like public works.”

Now, Canady and Sevco are laying the groundwork for multiple solar projects. Eventually, they hope to bring to life what local high school student, and member of the original volunteer sustainability task force, Kayle Palmore, dreamed of in an essay titled “A Day in 2045,” which envisions bike lanes, wide sidewalks, solar panels, and electric vehicle charging stations on every street corner.

“A smile spreads across your face as you think of how much you love this beautiful city,” Palmore writes.

*Originally published  
by Nexus Media News  
February 14, 2024*

# Ecocide: What is it and should it be considered an international crime?

**Campaigners and legal experts say the concept of ecocide should be recognised by the International Criminal Court to punish environmental offences**

FERMIN KOOP  
Dialogo Chino

Addressing the International Criminal Court (ICC) in 2019, John Licht, Vanuatu's ambassador to the European Union, recommended making environmental destruction an international crime: "This radical idea merits serious discussion in the face of the scientific evidence showing that climate change poses existential threats to civilisations."

As a small island state threatened by rising sea levels, Vanuatu has now become one of the main supporters of a campaign to make "ecocide" an international crime. They argue that such offences should be under the jurisdiction of the ICC, which currently prosecutes four crimes: genocide, war crimes, crimes against humanity, and the crime of aggression, which is "the use of armed force by a state against the sovereignty, integrity or independence of another state".

## What is ecocide?

Ecocide describes any kind of activity that knowingly causes significant environmental harm. In 2021, an independent panel of experts convened by the non-profit Stop Ecocide International (SEI) announced a largely accepted definition: "unlawful or wanton acts committed with knowledge that there is substantial likelihood of severe and either widespread or long-term damage to the environment being caused by those acts."

The term "ecocide" first emerged during the Vietnam War, used to describe the destructive environmental consequences of the defoliant Agent Orange. After featuring in United Nations talks during the following decades, by

1998, ecocide had been proposed as an international crime against peace in a draft of the Rome Statute, the treaty that created the ICC.

A legal definition of ecocide as a crime did not make it into the final Rome Statute, but changing this became the main goal of the Scottish lawyer Polly Higgins. One of the most prominent voices in the global movement for the recognition of ecocide, she co-founded the organisation Stop Ecocide International with Jojo Mehta in 2017, and campaigned actively until her death in 2019.

Speaking with Diálogo Chino, Mehta says she is confident that progress is being made, and that ecocide will likely be acknowledged by the ICC before 2030.

"The word has been around for 50 years but it only recently started to become more popular," says Mehta. "The Rome Statute designated the most severe crimes that affect the global community. Severe damage to the environment belongs in that category. Destruction of the environment is as wrong as the severe destruction of people."

## Should ecocide be an international crime?

The ICC currently recognises environmental destruction in the context of war, having the jurisdiction to prosecute such damage as a war crime. Were the court to recognise ecocide, it would extend the possibility of prosecutions of



individuals for harms such as deforestation; the court only holds individuals accountable, which means those at the top of industries and governments would face ecocide charges, rather than organisations or states. Criminalising ecocide would also address a legal gap related to the environment, campaigners argue. Legal accountability typically hinges on damage to individuals, or private or public property. This framework proves challenging when polluters are contributing to the more extensive destruction that causes global-level harm.

***“We have environmental agreements but they are not binding; there’s nothing with real teeth.***

***Ecocide provides this”***

Jojo Mehta, co-founder  
of Stop Ecocide International

In 2018, the UN report “Gaps in International Environmental Law” found the existing environmental law regime to be fragmented, unclear and reactive. “It is characterised by fragmentation and a general lack of coherence and synergy among a large body of sectoral regulatory frameworks,” the report reads, claiming this leads to a deficit in coordination at the law-making and implementation levels.

Kate Mackintosh, a researcher at the University of California and a co-creator of SEI’s ecocide definition, tells *Diálogo Chino* that its criminalisation would hit corporate actors the hardest. “Imaging sitting in the board room to discuss a fossil fuel project and the legal team says there’s a risk of ecocide – it has a high deterrent value,” she says.

## **Has the ecocide concept gained momentum?**

In 2022, Pope Francis wrote a letter to the Argentinean Association of Professors of Criminal Law that referenced ecocide and called upon the legal system to “create a normative system that includes insurmountable limits and ensures the protection of ecosystems.” Swedish climate activist Greta Thunberg has also supported the campaign, donating 100,000 euros (US\$109,000) to the Stop Ecocide Foundation in 2020.

In 2021, France’s National Assembly passed an environmental bill that made ecocide a civil offence. In the same year, Belgium’s Federal Parliament adopted a resolution to recognise the crime of ecocide at a national and international level. Last November, the European Union agreed to update its environmental crime directive, punishing cases of ecosystem destruction with tougher penalties.

In Latin America, Chile approved a law in August 2023 that added a new chapter to its Penal Code related to crimes against the environment; it incorporates several elements

of the ecocide definition. Earlier in June, in Brazil, the left-wing political party PSOL presented an ecocide bill to Congress, while in Mexico a similar bill was submitted in August. “There’s a strong basis for support for ecocide; there are active discussions in parliaments around the world,” Anna Maddrick, a legal analyst for SEI, tells *Diálogo Chino*. “The general feeling in the court is that if there’s enough support from the states the court will be in favour. Ecocide is the missing element in the Rome Statute.”

The ICC has also placed emphasis on prosecuting environmental crimes within the limitations of its existing jurisdiction. A 2016 policy paper on case selection highlighted the court’s inclination to prosecute crimes involving illegal natural resource exploitation, land-grabbing and environmental damage. This triggered several complaints against Brazil’s ex-president Jair Bolsonaro to be filed with the ICC, citing his destruction of environmental policies and violations of Indigenous rights. So far, these cases have not been taken up the court.

“If ecocide had been recognised already, some of what happened in places like Brazil would have gone a different way,” says Mehta.

## **What needs to happen next?**

The movement to criminalise ecocide has clearly gained momentum in recent years, yet several challenges must be overcome to achieve its inclusion in the ICC’s statute.

Initially, a country must propose an amendment to the Rome Statute. For this proposal to proceed to negotiations, it must be approved by a majority of the 124 states parties to the statute. Then, the proposal undergoes multiple negotiation rounds before returning to these members for another vote. To pass, an amendment needs support from at least two-thirds of members.

Were such an amendment to successfully pass these stages, individual member states would still retain the right not to ratify it. This outcome would impose limitations on the ICC’s jurisdiction over that member’s territories and citizens. Additionally, states that are not party to the Rome Statute would be unaffected, further limiting the reach of such ecocide legislation.

While Vanuatu has raised the issue on the political agenda, the country has yet to officially propose the modification of the Rome Statute. Whether any government will take such a bold step remains to be seen, but Mehta argues that the likelihood is increasing: “The more the conversation grows, the faster it expands at a political level.”

*Originally published  
by Dialogo Chino  
January 16, 2024*

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# Community Opposition Adds Roadblocks to Large Renewables Projects



GAYE TAYLOR  
The Energy Mix

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A survey of renewable energy developers in the United States—and instances of community opposition to large solar and wind projects in Canada and abroad—indicate that improved engagement with locals could spur renewables growth and help counter misinformation campaigns inflamed by influencers from outside the neighbourhood.

Community opposition is a key factor leading to the cancellation of wind and solar projects, alongside issues related to local zoning and grid interconnections, found a survey recently conducted by the Lawrence Berkeley National Laboratory.

The weight of such community resistance was evident in the early February cancellation of a proposed 150-megawatt solar farm in Millington, Tennessee, and is currently influencing discussions around a solar farm project north of Cranbrook, British Columbia and battery installations in Ontario.

Berlin-based Photovolt Development Partners is also contending with community challenges while seeking approval for its ambitious 840-MW Botley West Solar Farm in Oxfordshire, United Kingdom.

Polling 123 professionals from 62 developers responsible for about half of the large renewable energy projects in the U.S. between 2016 and 2023, Berkeley Lab found that approximately one-third of wind and solar siting applications submitted in the last five years were cancelled, with half experiencing delays of six months or more, writes Inside Climate News. Solar projects were slightly more prone to cancellation or delays, often during permitting, but also during the site control or construction phases.

There was a consensus among respondents that community opposition to both wind and solar has become more common and costly to address over the past five years. There was also agreement that both trends are likely to intensify, with 80% of developers “at least moderately concerned that community opposition will get in the way of decarbonization goals,” writes Berkeley Lab. The duration of community opposition to solar and wind projects averaged 11 and 14 months, respectively.

“Developers believe that community engagement addresses community concerns and decreases op-





Wind turbines in a field with clouds and blue sky.  
Photo credit: ZaetaFlow Sec (Pexels)

position,” the lab found. “Most agree that increased engagement results in fewer project cancellations (75%) and local concerns are adequately addressed before project construction (66%).”

Asked to reflect on the latest cancelled project they had worked on, most respondents indicated that earlier engagement would have been a good idea.” However, a few said “early engagement allowed opposition to form, which ultimately led to cancellation.”

### **Opposition ‘Driven by Outsiders’**

Berkeley Lab’s survey found “the vast majority” of respondents, about 95%, reporting that community opposition is “often caused by a vocal minority.” About half said those voices may not be local, with community opposition being “more often driven by outsiders.”

Groups like the Washington, D.C.-based Citizens for Responsible Solar, led by well-connected political operative Susan Ralston, exemplify external ef-

forts to undermine renewable projects across multiple U.S. states. The organization has been fought solar projects in coal-producing Kentucky, Ohio, Pennsylvania, and Virginia, National Public Radio found in a news investigation last February.

Citizens for Responsible Solar seems to be a well-mobilized “national effort to foment local opposition to renewable energy,” Michael Burger, executive director of the Sabin Center for Climate Change Law at Columbia University, told NPR. “What that reflects is the unfortunate politicization of climate change, the politicization of energy, and, unfortunately, the political nature of the energy transition, which is really just a necessary response to an environmental reality.”

NPR writes that when Ralston was creating the organization, she consulted people like John Droz – a longtime critic of the wind industry and member of the CO<sub>2</sub> Coalition, a non-profit supported by fossil fuel magnate Charles Koch. A number of the concerns Droz raises about wind are echoed on the Citizens for Responsible Solar website, NPR says. The

material is “extremely misleading and appears designed to be misinformation,” according to Ronald Meyers, director of the Renewable Energy Facility Siting project at Virginia Tech.

“Responsible Solar” activist groups have also popped up in Kansas — much to the chagrin of two Kansas farmers fighting for permits to build a solar farm on family land — and Iowa.

Groups like that “are operating from the same playbook featuring shared materials and draft petitions from national sources that originate thousands of miles from Iowa,” reports NPR, citing Ray Gaesser, chair of the Iowa Conservative Energy Forum, which fights for renewables projects on economic grounds. “Their mission is to kill new development, not to help develop common-sense ordinances,” Gaesser says.

## **Bright, Red Posters**

Over in Oxfordshire, some opponents of Botley West are circulating bright, red posters declaring that the solar farm is “Russia-owned” and therefore in breach of the international sanctions imposed after Vladimir Putin’s invasion of Ukraine. Project director Mark Owen-Lloyd rejects the claim, and is promising to make all investment sources clear in the project planning application due in June.

Meanwhile, Botley West developer Photovolt has begun pushing back against claims of a failure to consult, instructing its PR firm, DRD Partnership, to engage in email outreach with climate solutions journalists.

In one recent email, DRD senior associate Anna Cacciaguerra Ranghieri described the “vocal and fierce” opposition to Botley West as a bellwether for what awaits large renewables projects across the country. “We can expect to see more of this as the UK produces the scale of development needed to reach our net-zero goals,” she wrote, describing a pattern of broad acceptance of renewables in prin-

ciple, followed by a loud objection to having utility-scale projects anywhere in sight.

Concerns about the visual impacts of renewables constitute the “single largest objection” to new projects, according to data gathered by Photovolt during its consultation with Oxfordshire residents, Ranghieri said. Her assertion echoes the Berkeley Lab’s findings: “Developers report visual concerns to be the most likely root cause of community opposition for both wind and solar. Other leading concerns for wind are sound, community character, and property values, and for solar are loss of agricultural land, community character, and property values.”

The Energy Mix asked Ranghieri about claims made by the chair of the Stop Botley West Community Group that consultation has been “shamefully inadequate.” She responded with a statement from Owen-Lloyd that Photovolt is “deeply committed to consultation with local residents.”

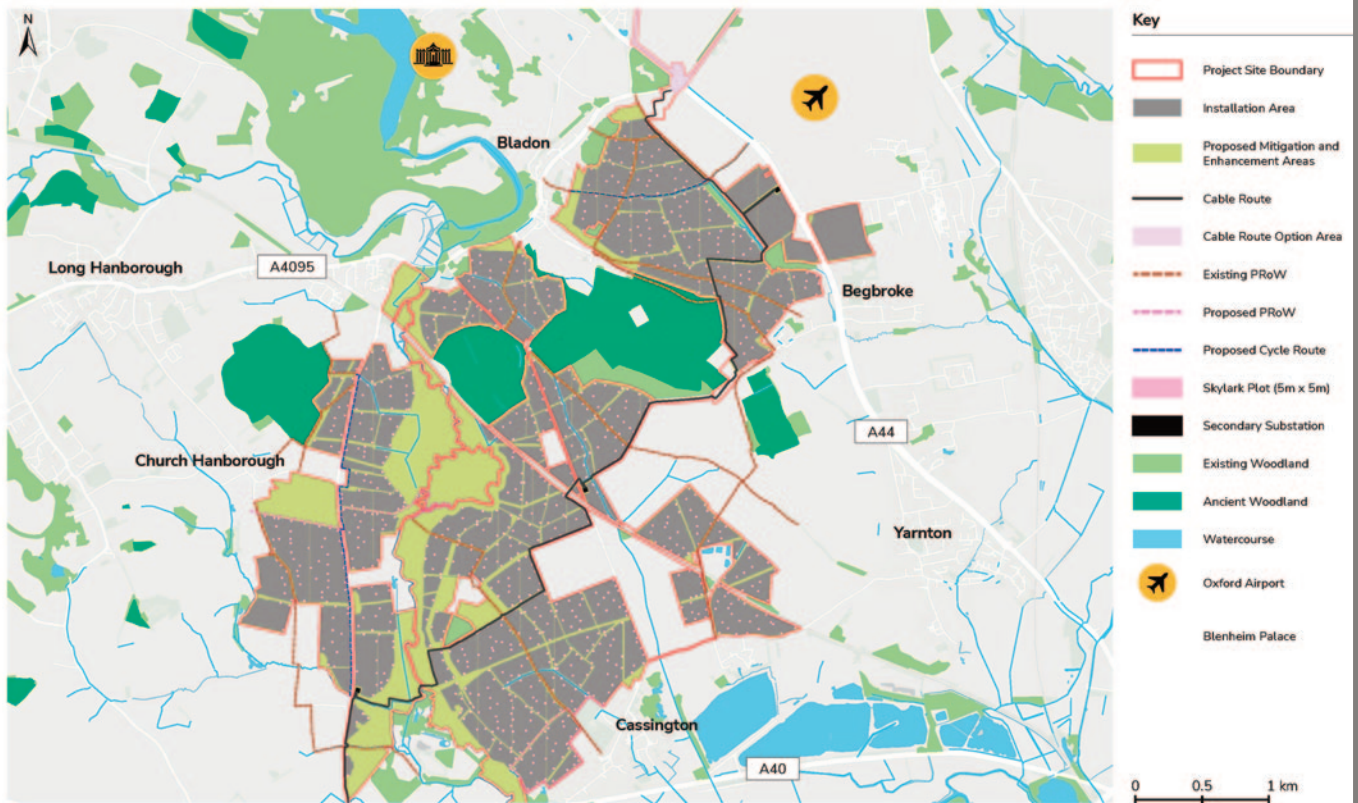
“We recently conducted our second, rigorous 10-week consultation process in tandem with the community that has significantly surpassed the standard regulatory requirements typically set for a 28-day consultation period,” Owen-Lloyd said.

“We worked closely with the community in all cases, with certain consultation meetings arranged at locations that were not required, but requested by local people or a local planning authority,” he added.

But there are signs that the fate of Botley West is now out of the hands of local residents. The West Oxfordshire District Council had some influence, and managed to get Photovolt’s agreement on increased setbacks, a community benefit fund, and discounted electricity prices. But the solar farm is being treated as a national infrastructure project due to its size — so its ultimate fate rests with the UK Planning Inspectorate, noted the West Oxfordshire Green Party.



## Central Site Map



## The Costs—and Rewards—of Engagement

Around 65% of solar developers and 55% of wind developers told Berkeley Lab they are “spending more to address and mitigate community opposition than five years ago.”

Even so, “typical community engagement expenditures represent a small fraction of total capital expenditures for both wind and solar,” Berkeley Lab notes. And besides, whatever the cause, “project cancellations result in average sunk costs (expenses spent on the project that could not be recovered) of more than US\$2 million per project for solar, and \$7.5 million for wind.”

A brewing battle in the forested grasslands north of Cranbrook shows how outreach is crucial for conveying key facts to the community.

Just north of the city, Vancouver-based Enterprise Renewables is working to secure a permit to survey

a 50-square-kilometre swath of rangeland and forest to determine the best location for a proposed two-square-kilometre solar farm.

But at least one irate letter writer—a local resident—has concluded that Enterprise intends to build across the entire survey area—an ambition that would leave Botley West looking like a cricket pitch.

“If this farm, if one can even call it that, moves forward, it would destroy the forest with clearcutting and chemically wipe out all grass and vegetation, making the land look like a nuclear blast site,” writes the concerned citizen. Such hyperbolic and misconceived claims show that work remains to be done to bring inside local communities, especially rural ones whose connection to the land is so visceral.

*Originally published  
by The Energy Mix  
March 7, 2024*

# LAST STAND

Photo credit: ONE



## ARGENTIERA

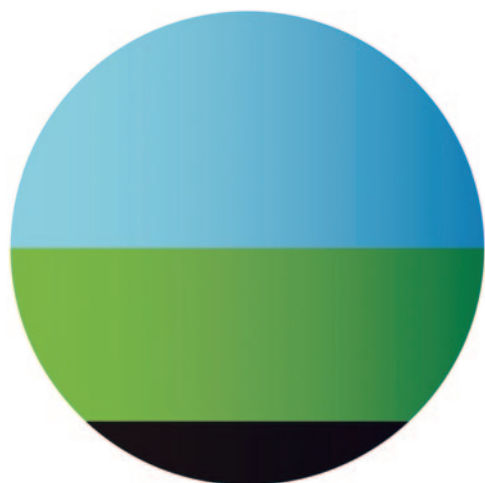
The Argentiera mining village is an almost wholly abandoned mining village about 35 miles from Sassari (Sardinia, Italy). In its heyday, it had more than 2,000 inhabitants. Mining concessions for the extraction of argentiferous lead and zinc had been granted here since the mid-19th century. Given the presence of Domus de Janas, the site of Argentiera was arguably known as early as the Copper Age.

Argentiera is an abandoned village, but not entirely. A few families still live there, evidently attracted by a unique location with even more significant tourist potential than mining. Yet, it remains an unfinished business, with the various attempts at recovery having so far proved vague and inclusive, as witnessed by the endless recovery of the marvellous wooden "laveria" overlooking the sea.

Not even the neglect that has characterised the area since the mine closed in 1963 erases the charm of the village, which grew up around the Camillo Marchese square and along the canyon that slides from the mountains towards the San Nicola natural harbour from which the sailboats transferred the extracted ore towards Porto Conte and then to the ports of Northern Europe. A village that combines a natural enchantment with the remains of a monument to engineering and architectural prowess, resembling the Pozzo Podestà of the Rietto and Calabronis tunnels, works even of Roman origin. **ONE**



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