

THE UNTAPPED POTENTIAL OF GEOTHERMAL ENERGY

HOW GEOTHERMAL ENERGY CAN CONTRIBUTE TO A NEW RELIABLE ENERGY GRID

by Mason Harris '24

Just a decade ago, climate projections for this century looked increasingly apocalyptic, with most scientists warning that sustained inaction would bring the world four or even five degrees Celsius of warming — a change disruptive enough to call forth not only predictions of food crises and heat stress, state conflict and economic strife, but, from some corners, warnings of civilizational collapse. However, according to a new United Nations report from the COP27 climate conference in Sharm el Sheikh, Egypt, with the world already 1.2 degrees hotter, warming this century will almost certainly fall between two or three degrees. Due to astonishing declines in the price of renewables, a global political mobilization, and serious policy focus from world leaders, the world has cut expected warming almost in half in the span of a decade. One of the most significant developments in renewables that has led to this astonishing turnaround is geothermal energy.

“Colorado has great wind and solar potential, but both of those have the drawback of big drops in production. Whereas geothermal is interesting because, if we can tap into that

geothermal energy, it’s perpetual. It doesn’t matter if it’s night or day because it’s constant,” said Kevin Russell, a science teacher at Regis Jesuit High School.

Geothermal technology extracts the heat found within the subsurface of the earth. Geothermal energy primarily centers around reservoirs of hot water that exist at varying temperatures and depths below the Earth’s surface. Wells, ranging from a few feet to several miles deep, can be drilled into underground reservoirs to tap steam and very hot water to be brought to the surface for

various applications, including electricity generation, direct use, and heating and cooling.

“They can use geothermal energy for independent houses and other buildings around Denver. This potential of residential geothermal energy, not for energy production but for heating and cooling homes, and the efficiency of it, is pretty astounding. The cost of installation varies, but it’s relatively attainable, and that idea of using heat pumps instead of propane reduces carbon dioxide emissions tenfold,” Russell said.



Geothermal energy plants harvest heat stored in the subsurface of the earth to create steam in order to turn turbines producing renewable energy for individual and commercial use.

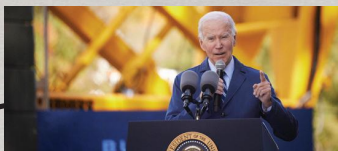
GLOBAL EFFORTS TO LIMIT CLIMATE CHANGE FROM 2016 TO 2050

PARIS CLIMATE ACCORDS NOV 4, 2016



Adopted by 196 different parties at the UN Climate Change Conference, this international treaty focused on limiting the increase of the global average temperature to less than 2 degrees Celsius above pre-industrial temperatures.

BIPARTISAN INFRASTRUCTURE LAW & BUILD BACK BETTER ACT NOV 15-19 2021



President Biden signed the Bipartisan Infrastructure Bill into Law increasing government investment into cleaner infrastructure and cleaner energy of the future.

USAID CLIMATE STRATEGY 2022-2030



The United States Agency for International Development developed a strategy in order to combat climate change in the United States and the around world. This agency is responsible for administering civilian foreign aid and development assistance.



UNDERSTANDING THE GLOBAL CLIMATE AGENDA

COMBATING AMERICA'S DECLINING INFRASTRUCTURE THROUGH THE BIPARTISAN INFRASTRUCTURE LAW AND THE BUILD BACK BETTER ACT

by Mason Harris '24



In November of 2021,

President Biden passed the Bipartisan Infrastructure Law and the Build Back Better Act into law, providing over \$3.5 trillion to combat the increasingly complex climate crisis. This new legislation aims to rebuild America's roads, bridges, ports, rails, airports, expand access to clean drinking water, ensure widespread access to high-speed internet, and fund public works projects. The legislation addresses a broad range of needs in the United States' built environment, rated C-minus by the American Society of Civil Engineers (ASCE) in their 2021 Report Card for American infrastructure. According to the ASCE, growing wear and tear have left 43% of public roadways in poor or mediocre condition, which has remained stagnant over the past several years. In addition, 42% of all bridges are at least 50 years old, and 7.5% of the nation's bridges, are considered structurally deficient and at risk of collapse.

"This Bipartisan Infrastructure Law makes a down payment on ensuring that future generations have clean air, drinkable water, fertile soil, and an overall quality of life that is currently threatened by the worsening climate crisis," said Secretary of the Interior Deb Haaland. "Over the last year, it has helped us put significant resources into the hands of

local communities to meet their everyday challenges."

Colorado has 481 bridges and over 3,620 miles of highway in poor condition. Colorado expects to receive approximately \$3.7 billion over five years in federal funding for highways and bridges.

"When you think of concessions, I think the reality is that congress can become intransigent and not willing to give in on one side or the other, mostly out of a fear of how their voters will see those concessions. However, the new Bipartisan Infrastructure Law allows states to decide individual needs," said Heidi Kabadi, Social Studies Chair at Regis Jesuit High School.

The Bipartisan Infrastructure Law includes many categorical and competitive grant programs. Categorical grants, also called conditional grants, are grants issued by the United States Congress that may be spent only for narrowly defined purposes, including roads, bridges, dams, and more. On the contrary, competitive grants are awarded based on states' applications to facilitate programs in their regions. The Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant allows states to apply for federal grants for surface transportation infrastructure projects.

"While severe partisanship exists currently, and that's with environmental legislation and most other forms of legislation, more and more people are recognizing how much the public cares about these issues, and that means federal aid will continue to reflect the public's desires," Kabadi continued. "These programs really have a chance to meet the public's needs."

DID YOU KNOW?

The Biden Administration has announced over \$185 billion in funding and over 6,900 specific projects, including public works projects in Colorado?

UNITED NATIONS' 2030 SDG ACHIEVEMENT BY 2030



The United Nations' goal to limit world poverty and hunger, as well as keeping the world's habits safe and sustainable with the development of more sustainable practices.

CARBON NEUTRAL GOAL BY 2035



President Biden set the goals to have 100% carbon-free electricity powering the grid in the United States by 2030 and to have 100% zero-emission vehicle acquisitions by 2035.

UNITED NATIONS' NET-ZERO GOAL BY 2050



The United Nations set a goal to reach zero greenhouse gas emissions by the year 2050. A global effort to mitigate the effects from climate change.