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# iowa

**ELECTRIC COOPERATIVE LIVING**



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# A DEEP DIVE INTO NUCLEAR POWER

BY GARRETT THOMPSON



To kick off our “all-the-above” series on energy generation resources, I want to start with my personal favorite, nuclear power.

Nuclear has gained a lot of attention with climate change initiatives, and rightly so. If we, as a country, are interested in moving away from fossil fuels and reducing our greenhouse gas emissions, all while having electricity available 24/7 year-round, nuclear is the clear answer. Nuclear energy isn't

without drawbacks; however, there is nothing else like it in the energy sector today.

## Overview

Nuclear power can be divided into two basic types: nuclear fission and nuclear fusion. Nuclear fusion is much more difficult to control and thus is not safe or reliable to use today. However, new technology is emerging in this arena that claims fusion reactors could last hundreds of years. It will be exciting to follow the developments in this technology.

Nuclear fission is what most, if not all, nuclear power plants use today. It's a process in which a neutron slams into another atom, often larger in size, and splits the larger atom into two smaller ones. At impact, additional neutrons are released, creating a chain reaction of atoms slamming into one another.

Whenever an atom is split, it releases a tremendous amount of energy, thus creating heat. That heat then warms a cooling agent, usually water, until it becomes steam. Once steam is produced, it turns a turbine that generates electricity to be placed onto the grid.

## Uranium ore

The atoms that are being split within the nuclear reactor are from the metal uranium. Uranium is a common element found naturally in low concentrations of soil, rock and water. It can be mined in a few different ways, such as an open pit or underground excavations. Uranium metal is very dense. At 19 grams per cubic centimeter, it is 1.67 times denser than lead, according to the U.S. Department of Energy nuclear fuel facts on uranium.

The U.S. imports most of the uranium it uses, but from 1961 through 1981, it produced more domestically than it imported. In 2022, the U.S. purchased 27% of its uranium from Canada, 25% from Kazakhstan,

12% from Russia, 11% from Uzbekistan, 9% from Australia, and 16% from six other countries combined, according to the U.S. Energy Information Administration report on the industry. Congress is currently working on legislation that would require uranium for nuclear power plants to be produced within the U.S.

## Nuclear waste and decommissioning

Nuclear power plants produce varying levels of radioactive waste, categorized from low to high. The radioactivity of nuclear waste decreases over time through a process called radioactive decay. Most waste related to a nuclear power plant has relatively low levels of radioactivity by volume.

High-level waste consists of spent nuclear fuel rods (containing uranium) and must be stored in a specially designed pool of water. The water acts as a radiation shield and helps cool the spent rods. There are also specially designed dry storage containers to house spent fuel rods using specialized concrete with air cooling.

When a nuclear reactor ceases operations, it must be decommissioned. Decommissioning involves safely removing the reactor and all equipment that has become radioactive from service. The U.S. Nuclear Regulatory Commission governs strict rules on how the decommissioning process is to be carried out due to the severity of the radiation. Often, there is a requirement that the owners of the nuclear plant

## SUMMER OFFICE HOURS

Beginning Tuesday, May 28, Franklin REC office hours will be adjusted to 6:30 a.m. to 3 p.m. for the summer season. Our phone lines are answered 24/7 at 641-456-2557 if you need assistance. To make a payment, call the secure payment line at 1-844-344-4370.



### Office

1560 Highway 65 • P.O. Box 437  
Hampton, IA 50441

### Office Hours

Monday through Friday, 7 a.m.-3:30 p.m.  
Closed Saturdays, Sundays and holidays

### Telephone Number

641-456-2557  
Calls answered 24/7

### Secure Pay-by-Phone Number

1-844-344-4370

### Website

[www.franklinrec.coop](http://www.franklinrec.coop)

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set aside a decommissioning fund to cover these costs.

### Financial cost

In July 2023, the first newly constructed nuclear unit in the U.S. was placed in service. Before Vogtle Unit 3 in Waynesboro, Georgia, was up and running, it had been more than 30 years since the U.S. had seen a new unit go live. This unit is estimated to power 500,000 homes, and another nuclear unit of similar size will come online sometime in 2024, according to an article by Marketplace.

If you've seen the news headlines surrounding this project, you'll know it was seven years behind schedule and cost an eye-watering \$35 billion. These are the major concerns surrounding nuclear energy: the time it takes to build a new unit and the final cost. However, these plants are estimated to have useful lives up to 80 years. To date, 20 nuclear units currently in service are planning to operate up to those 80 years, according to the U.S. Department of Energy. Imagine what building a new nuclear unit would cost 40 years from now.

### Small modular reactors

Small modular reactors (SMRs) are just what their name implies: smaller versions of traditional nuclear power plants. SMRs are generally 300 megawatts or less in size but can be "daisy chained" together to form a larger generation asset, according to the World Nuclear Association. For comparison purposes, the new Vogtle reactors in Georgia are over 1,100 megawatts.

SMRs are still a new technology; however, there are some promising

advantages if all come to fruition. Generally, SMRs are expected to be simpler in construction and design, thus leading to shorter construction times and a significant reduction in costs. Their footprint is also much smaller and will require less valuable land, also reducing the final cost. For example, a 920-megawatt SMR would only have a 35-acre footprint, while the traditional nuclear plant of a similar size would require 500 acres, according to the Idaho National Laboratory.

Most units are designed for a high level of passive or inherent safety in the event of a malfunction. This safety feature comes from SMRs that are designed to be placed below ground level. Being placed underground could also help with potential terrorist attacks.

Another advantage of SMRs is that they could be more strategically placed throughout the electric grid. This would help gain efficiencies and more accurately size generation plants to a specific portion of the grid.

### Summary

Overall, there are many positive and exciting things happening in the nuclear power world. It's a tried-and-true technology that works once the traditional construction timeline and costs can be overcome.

In my opinion, if our government is truly interested in reducing greenhouse gas emissions, they need to stop subsidizing solar and wind, and start financially helping companies build nuclear power plants as the backbone of our nation's energy security. Without nuclear or fossil fuel generation, our country will have to become accustomed to regular brownouts and/or rolling blackouts. Neither of which, I believe, is a viable option for a developed country that wants and needs safe, affordable and reliable electricity.

*Garrett Thompson is the CEO/General Manager of Franklin REC.*

*Sources: U.S. Department of Energy, U.S. Energy Information Administration, Marketplace, World Nuclear Association, Idaho National Library.*

## SHOW YOU CARE WITH RECare

As an electric cooperative, Franklin REC is invested in helping our communities thrive, and that means supporting our low-income member-consumers, too. RECare is a nationwide program exclusive to rural electric cooperatives encouraging fellow member-consumers to make a one-time or monthly donation to help other members in need.

Donations are directed to a local community action agency for distribution to low-income families on Franklin REC lines. Funds are used to help alleviate the financial stress for other member-consumers straining to pay their electric bills, or funds may also be used to weatherize the recipient's home to make electricity use more efficient. You can feel good that the dollars you donate are helping your friends and neighbors.



**YES,**

**I want to help my neighbors by contributing to RECare.**

- I will make a one-time contribution to Franklin REC's RECare program. My check is enclosed.
- I will contribute \$\_\_\_\_\_ per month to Franklin REC's RECare program. I understand that this amount is automatically added to my monthly electric bill.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State/Zip Code \_\_\_\_\_

Account # \_\_\_\_\_



## FROM YOUR BOARD ROOM

During the March meeting, Franklin REC directors:

- Approved work orders and special equipment capitalization of \$170,018.83
- Approved Reliability Plan and Report
- Approved delegates for Corn Belt Power Cooperative annual meeting
- Approved Federated Insurance Renewal Policy
- Approved Moll's Utility Services for construction work plan

## COMPLAINT PROCEDURE

**Effective May 22, 1991, the Iowa Utilities Board passed a ruling requiring all non-rate regulated utilities to post the following notice to its membership:**

If a member has a question or concern regarding his/her electric service, please write or call Franklin Rural Electric Cooperative at 1560 Highway 65, PO Box 437, Hampton, Iowa, 50441-0437 or 641-456-2557. Office hours are Monday through Friday, 6:30 a.m. to 3:00 p.m. from Memorial Day to Labor Day and 7 a.m. to 3:30 p.m. Labor Day to Memorial Day.

If your complaint is related to Franklin Rural Electric Cooperative's service rather than its rates and Franklin Rural Electric Cooperative does not resolve it, you may request assistance from the Iowa Utilities Board by calling 515-725-7321 or toll-free 877-565-4450; writing to 1375 E. Court Ave, Room 69, Des Moines, Iowa, 50319-0069; or emailing [customer@iub.iowa.gov](mailto:customer@iub.iowa.gov).

## CELEBRATING CO-OP WORKIVERSARIES

Congratulations to Karen Ringleb and Chad Foster, esteemed members of our management staff, as they celebrate their continued dedication and service at Franklin REC this month.



Ringleb, our office manager/CFO, has been an indispensable part of our cooperative for 35 years. Her unwavering commitment has been instrumental in ensuring the smooth administrative operations of the cooperative while effectively navigating technological advancements throughout her tenure.



Foster, our member service representative, has exemplified dedication during his 27-year journey with us. Starting as a member of the line crew, he has grown into the role of a trusted energy advisor, metering technician and member service representative.

We are grateful for their enduring contributions and unwavering commitment to our cooperative's success.

## COMMITMENT TO COMMUNITY

Franklin REC maintains its ongoing collaboration with the Iowa Department of Transportation as a highway helper within the Adopt-A-Highway initiative. Co-op workers contribute by participating in biannual clean-up efforts along a two-mile segment located west of Hampton.



### Adopt-A-Highway

Certificate of Appreciation  
presented to

## Franklin Rural Electric Cooperative

for their efforts in helping maintain and enhance  
the beauty of Iowa's roadsides by being  
an Adopt-A-Highway sponsor from

4/1/2022 - 4/1/2024

Paige Merrill, District 2  
Authorized Representative

  
Tony J. Gustafson, Director Field Operations Division



IOWA ELECTRIC COOPERATIVE LIVING

The magazine  
for members of  
Iowa's electric  
cooperatives.

May 2024

Visit our website at [www.franklinrec.coop](http://www.franklinrec.coop)

A black and white photograph of two construction workers in a field. They are both wearing heavy jackets and have their arms raised, reaching towards a white hard hat and a tool (possibly a wrench or a similar tool) that are suspended in the air above them. The background is a vast, open field with a cloudy sky.

# WE FOLLOW OUR DREAMS

Join Touchstone Energy Cooperatives in celebrating  
the power of human connections.



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