I. Meeting Packet

State of Florida
Public Service Commission
INTERNAL AFFAIRS AGENDA
Tuesday – July 11, 2023
Immediately Following Agenda Conference
Room 148 - Betty Easley Conference Center

1. An Introduction to Hydrogen, presented by Neca Espinoza, Vice President, Energy Supply and Low-Carbon Resources, Electric Power Research Institute and Jeffrey Preece, Director, Clean Energy Research and Development, Electric Power Research Institute (Attachment 1)

2. Draft 2022 Report on the Status of Competition in the Telecommunications Industry (Attachment 2)

3. Briefing on the U.S. Environmental Protection Agency's Proposed Rules Regarding Greenhouse Gas Standards and Guidelines for Fossil Fuel-Fired Power Plants (Attachment 3)

4. General Counsel's Report

5. Executive Director's report

6. Other Matters

BB/aml

OUTSIDE PERSONS WISHING TO ADDRESS THE COMMISSION ON ANY OF THE AGENDAED ITEMS SHOULD CONTACT THE OFFICE OF THE EXECUTIVE DIRECTOR AT (850) 413-6463.

Attachment 1

Low-Carbon Hydrogen

Potential Role in Enabling a Reliable, Affordable, and Resilient Energy Transition

Neva Espinoza
Vice President
Energy Supply and Low-Carbon Resources

Jeffery Preece
Director
Net-Zero Resources

Florida Public Service Commission
July 11, 2023

EPRI

Leading Global Collaborative Energy R&D

EPRI is advancing energy technologies and informing decision-making through ~$420M in collaborative annual research with more than 450 entities in 45 countries – spanning the production, delivery, and use of energy.

www.EPRI.com

The Future of Energy

Decarbonization

~10-15 years

Accelerate economy-wide, low-carbon solutions

- Electric sector decarbonization
- Transmission and grid flexibility: storage, demand, EVs
- Efficient electrification

~15-30 years

Achieve a net-zero clean energy system

- Ubiquitous clean electricity: renewables, advanced nuclear, CCUS
- Negative-emission technologies
- Low-carbon resources: hydrogen and related, low-carbon fuels, biofuels, and biogas

Transformation

Drive affordability of a clean and resilient energy system through digital transformation

- Power system modernization: pervasive sensors, monitoring, advanced analytics using AI
- Upgraded and expanded communications infrastructure and control systems

Resilience

~10-15 years

Mitigate climate impacts and cyber/physical risks

- System and asset hardening
- Improved response
- Faster recovery
- Cybersecurity

~15-30 years

Future proof energy system design basis

- Resilient power system design
- Advanced asset design and strategic undergrounding
- Smart integration of energy carriers

Making Energy More

Clean | **Affordable** | **Reliable**

Decarbonization Pathways Enabled by Innovation

Decarbonization

Accelerate economy-wide, low-carbon solutions

- Electric sector decarbonization
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Achieve a net-zero clean energy system

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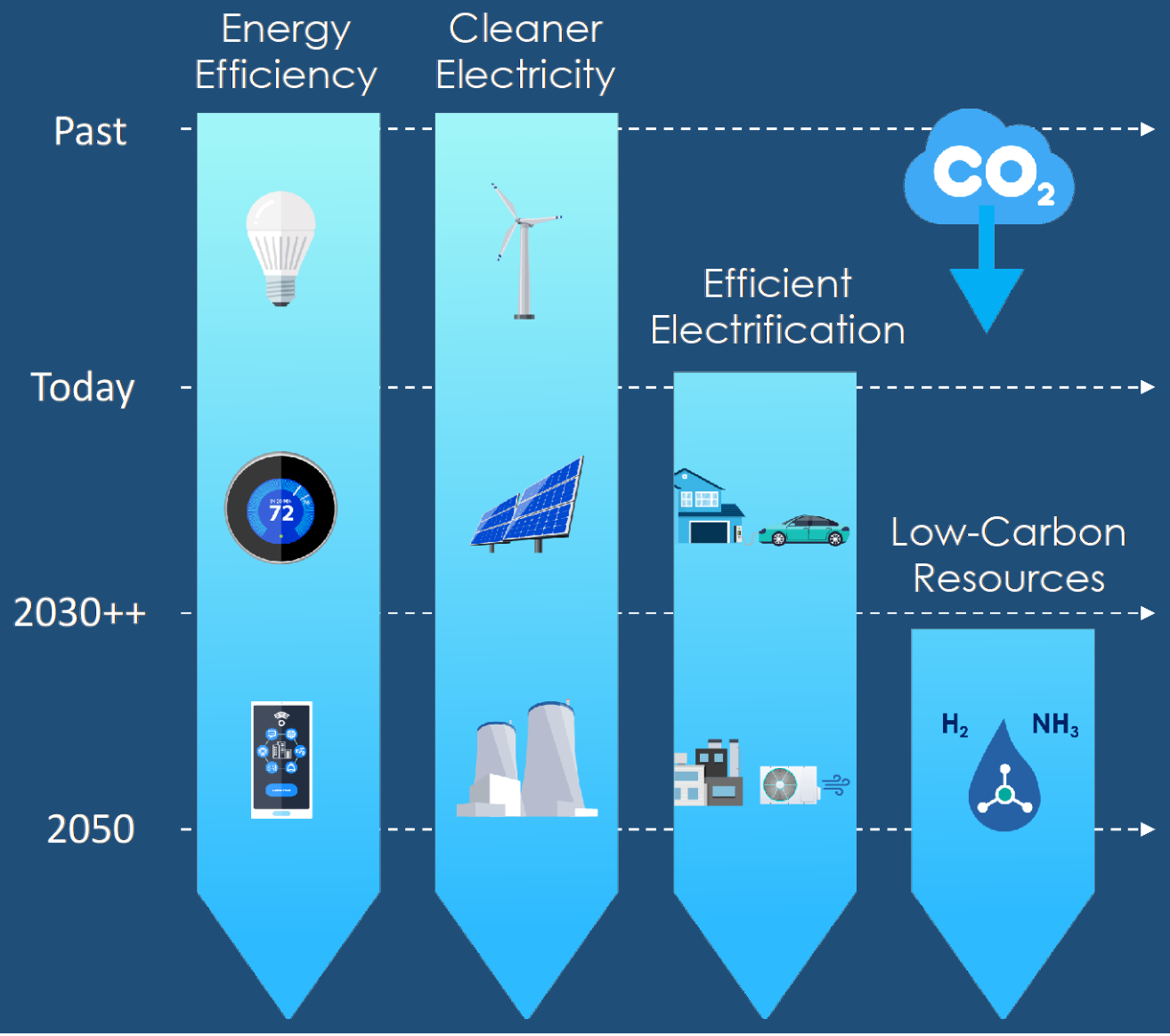
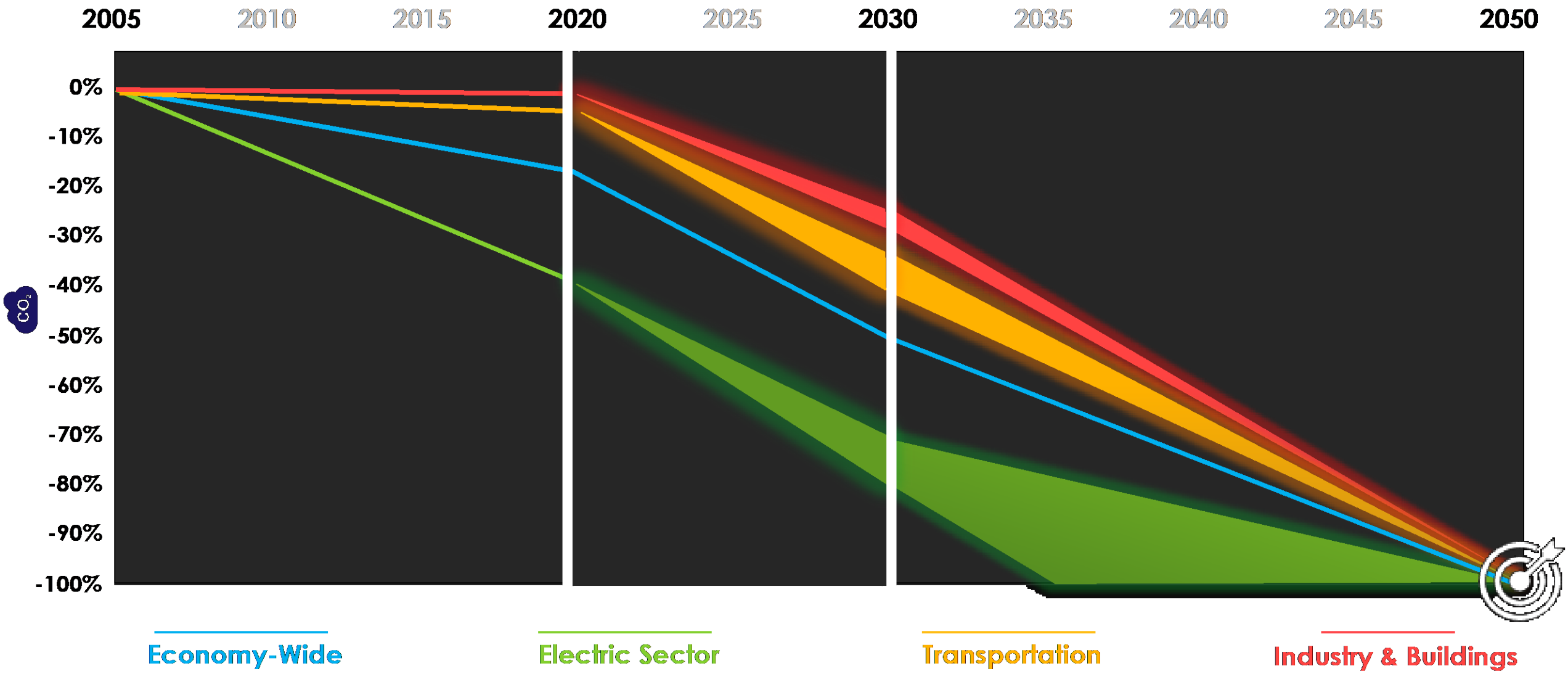


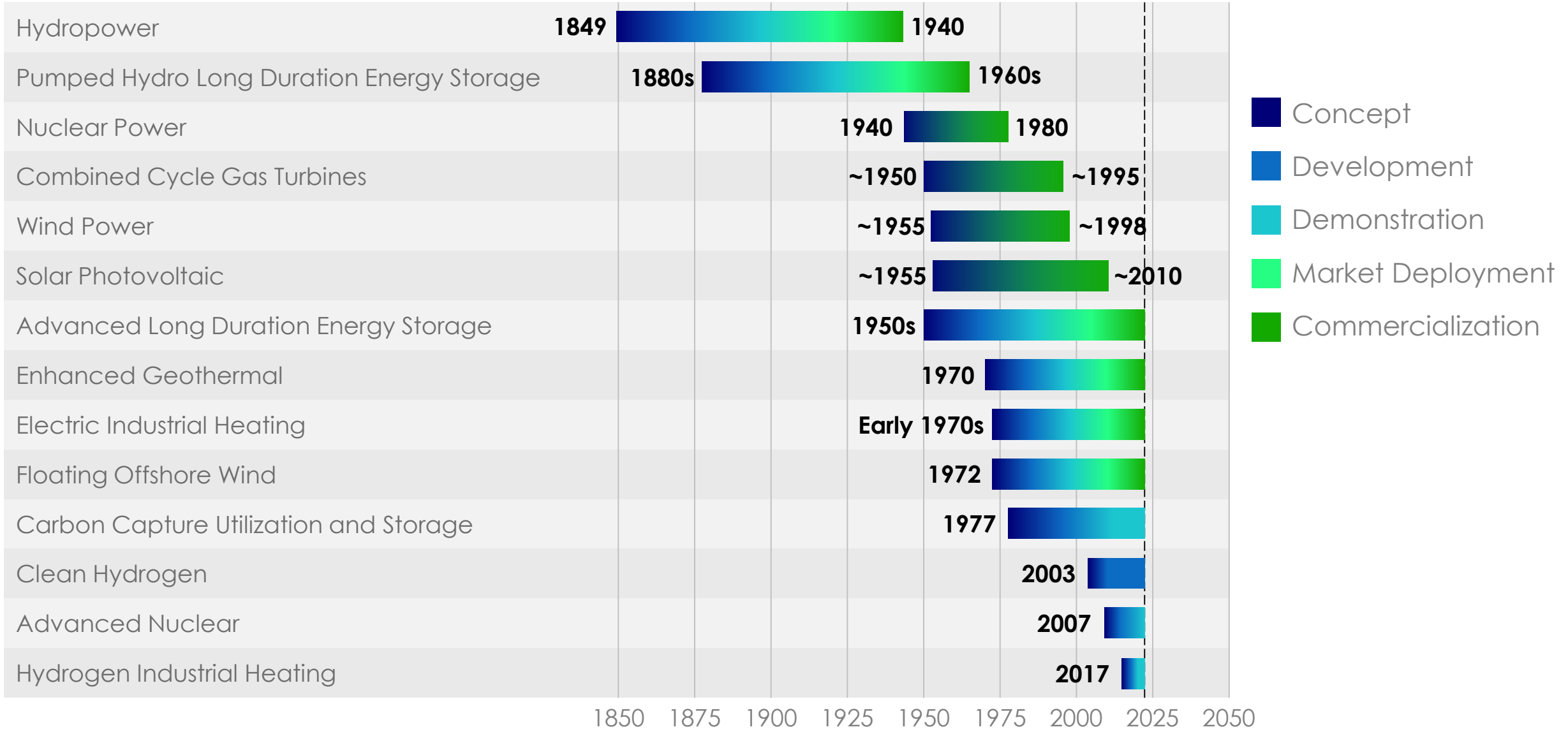
Pathway to Net-Zero

more technology needed

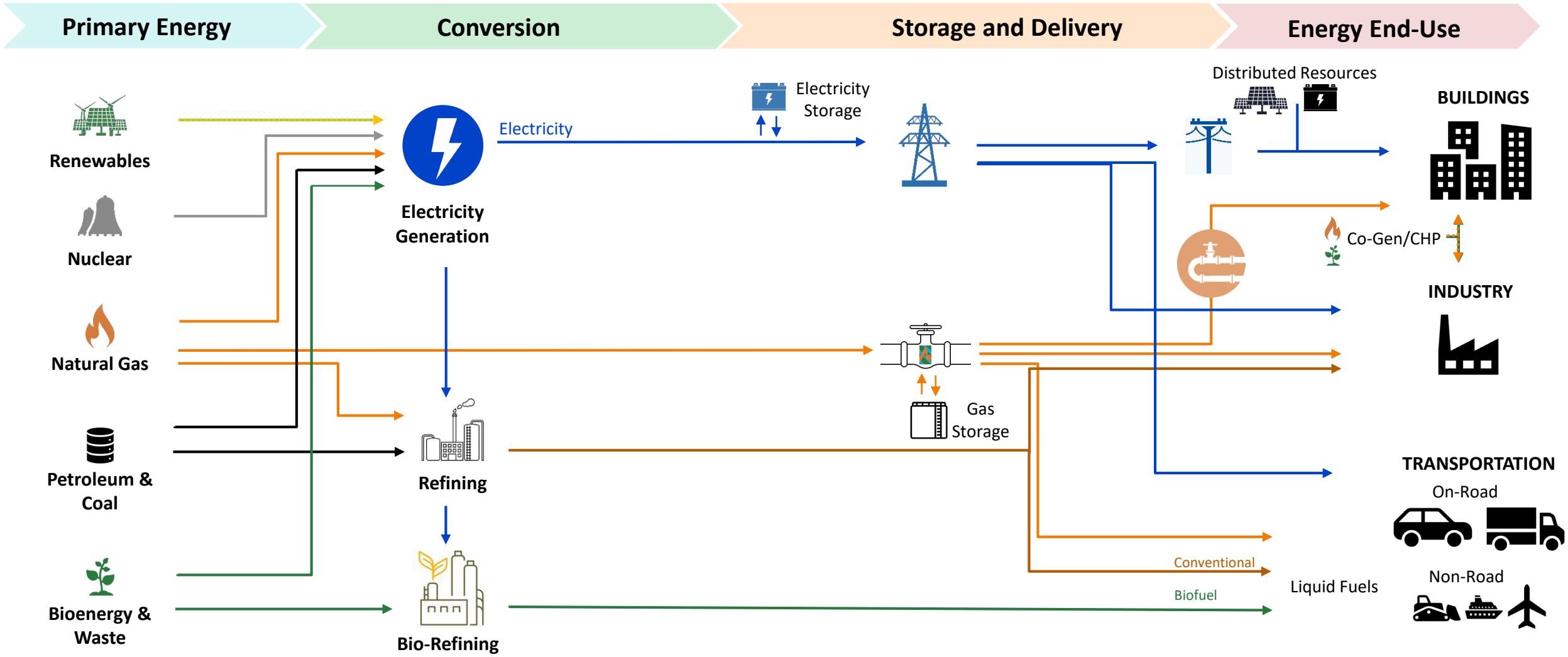


TECHNOLOGY

Decades of Effort
From concept to commercialization



Energy System is Becoming More Integrated



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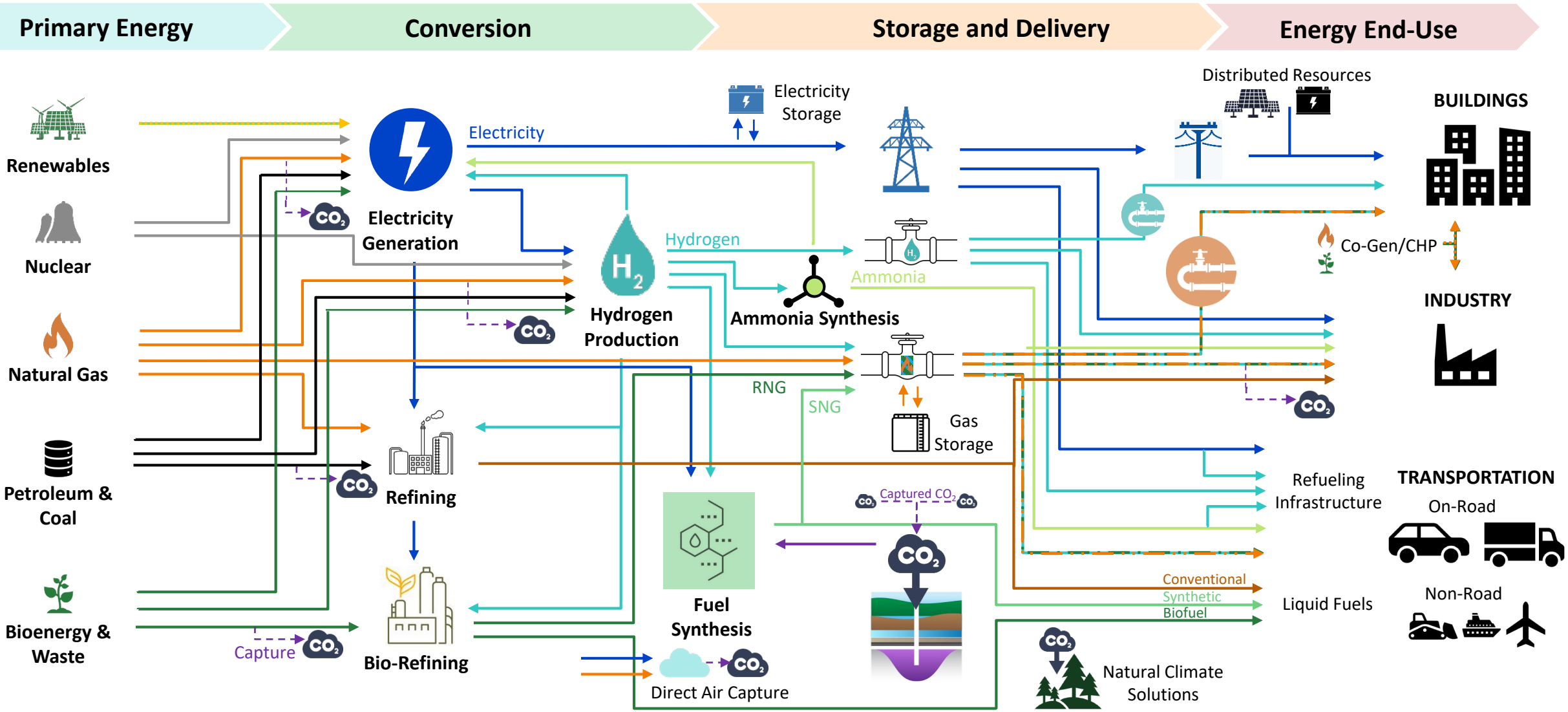


Hydrogen is not just a Technology – it is a new Energy Economy

Production Sources

Next Gen Technologies

Integrated Clean Electricity

Integrated Nuclear (Current & Advanced)

Natural Gas with CCS

Storage & Delivery

Existing Natural Gas Pipeline through Blending and/or New Infrastructure

Shipping, Trucking, and Conversion/Intermediates

Aboveground and Underground Storage

End Use Applications

Combustion

Heavy Duty Transportation

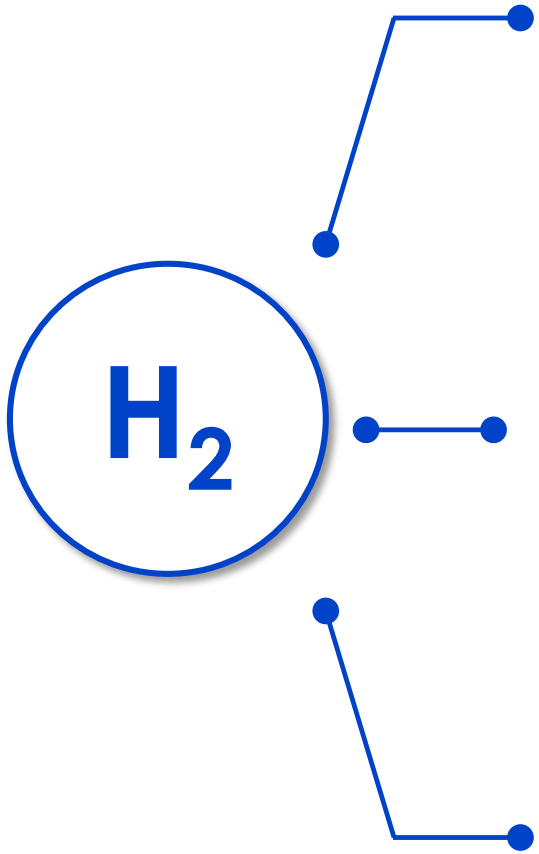
Electricity Generation

Advanced Fuel Cell

Large Industry

Chemical Processes

Key Aspects for Accelerating Deployment of Hydrogen



Clarifying Hydrogen's Role

- Decarbonization objectives
- Consumer adoption priorities
- Policy and regulatory impacts

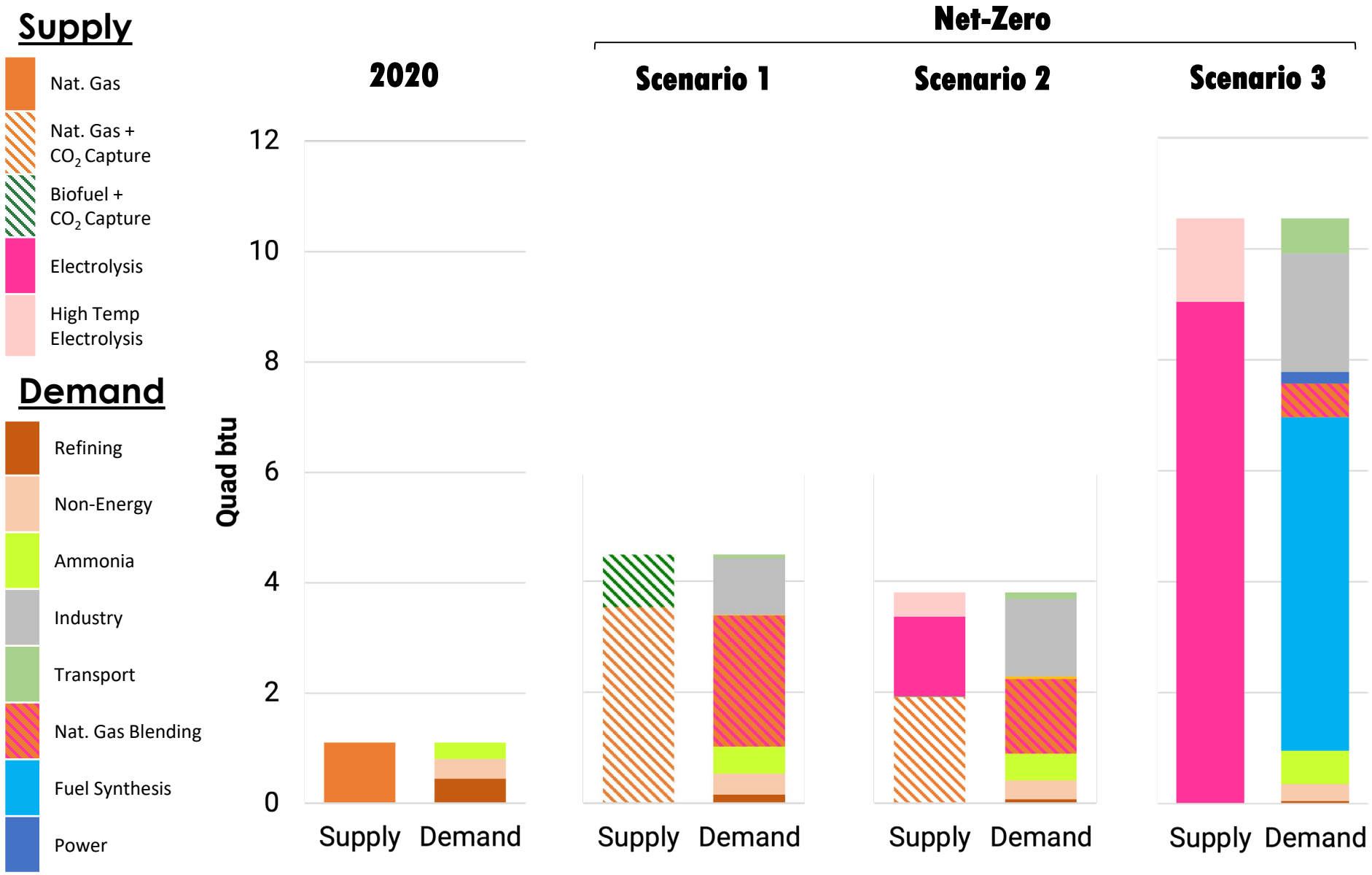
Supporting Regional Engagement

- Stakeholder education
- Workforce development and training
- Social and environmental justice priorities

Advancing Technology Adoption

- Demonstrations on production, storage, delivery, and use
- Expanded infrastructure for storage and delivery
- Best practices for design and operations

Potential Scale of Hydrogen in a Net-Zero Economy



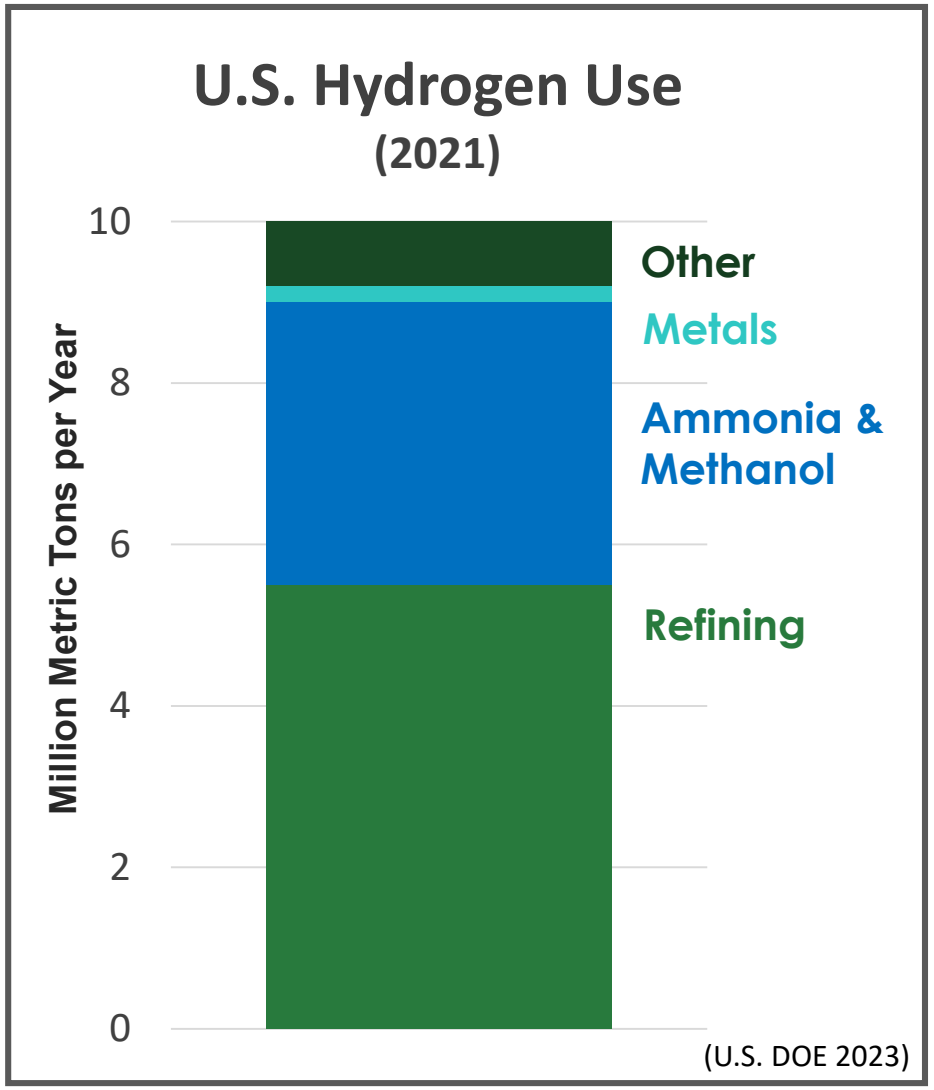
In a Net-Zero Economy…

- Electricity demand may increase ~1.5 – 2.5x
- 40% of electricity may go to hydrogen production
- Hydrogen may provide 4 – 10x the amount of energy it does today

Note: Does not include potential impacts from Inflation Reduction Act

Source: LCRI Report 3002024993

Hydrogen Production



WHAT IF…

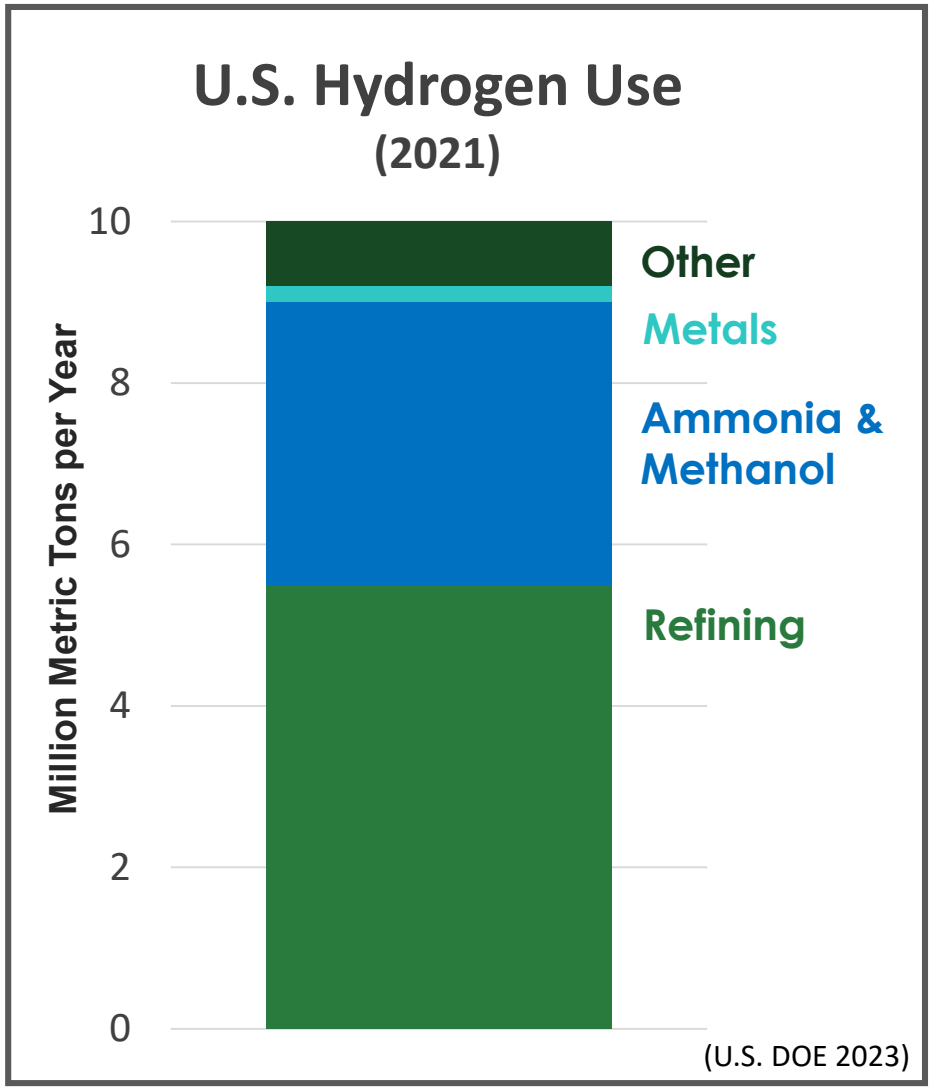
All U.S. hydrogen today were produced from electricity?

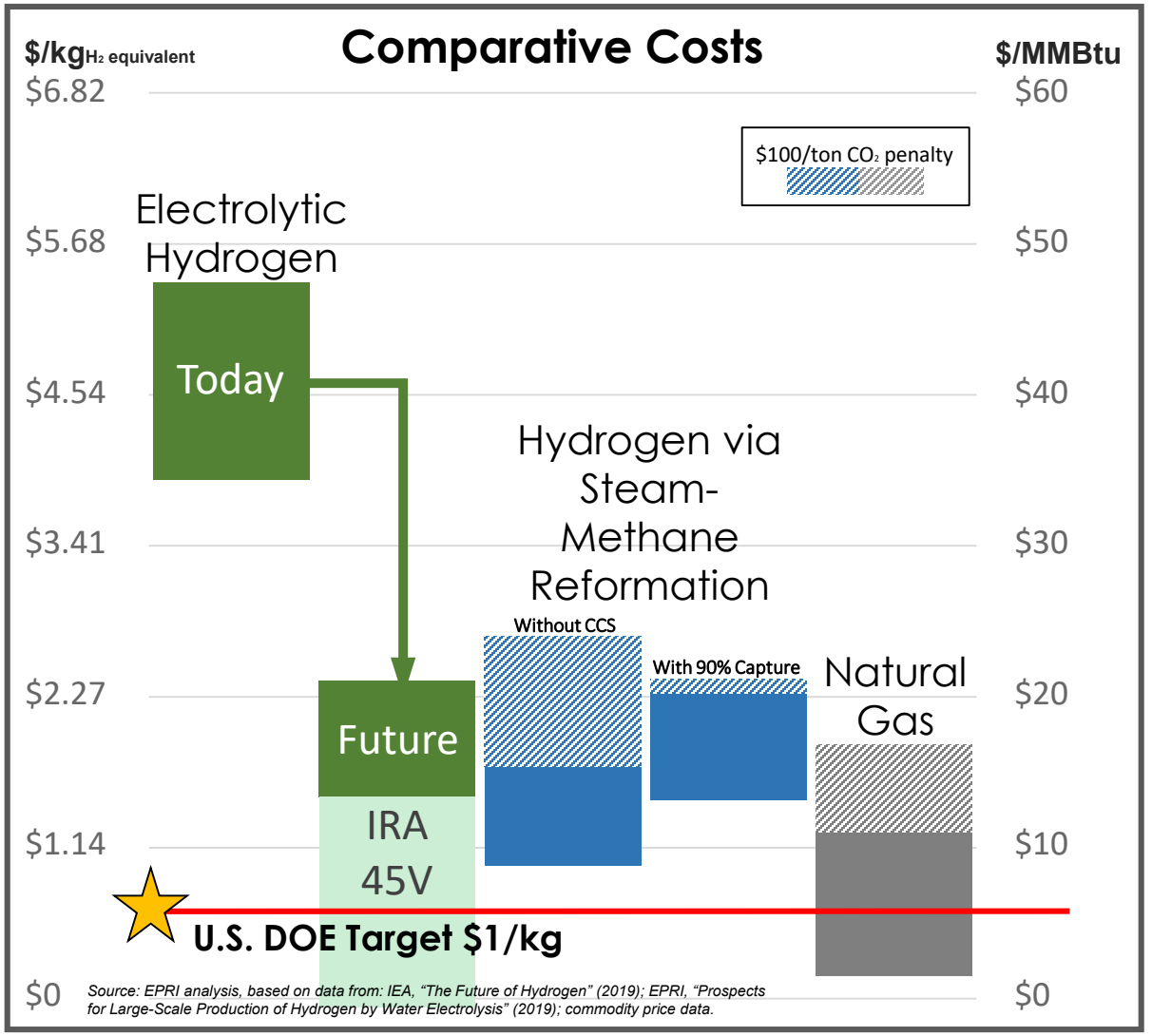
The amount of **electricity consumed** would be equal to…

…~**10%** of the total electricity **generated** in the country…

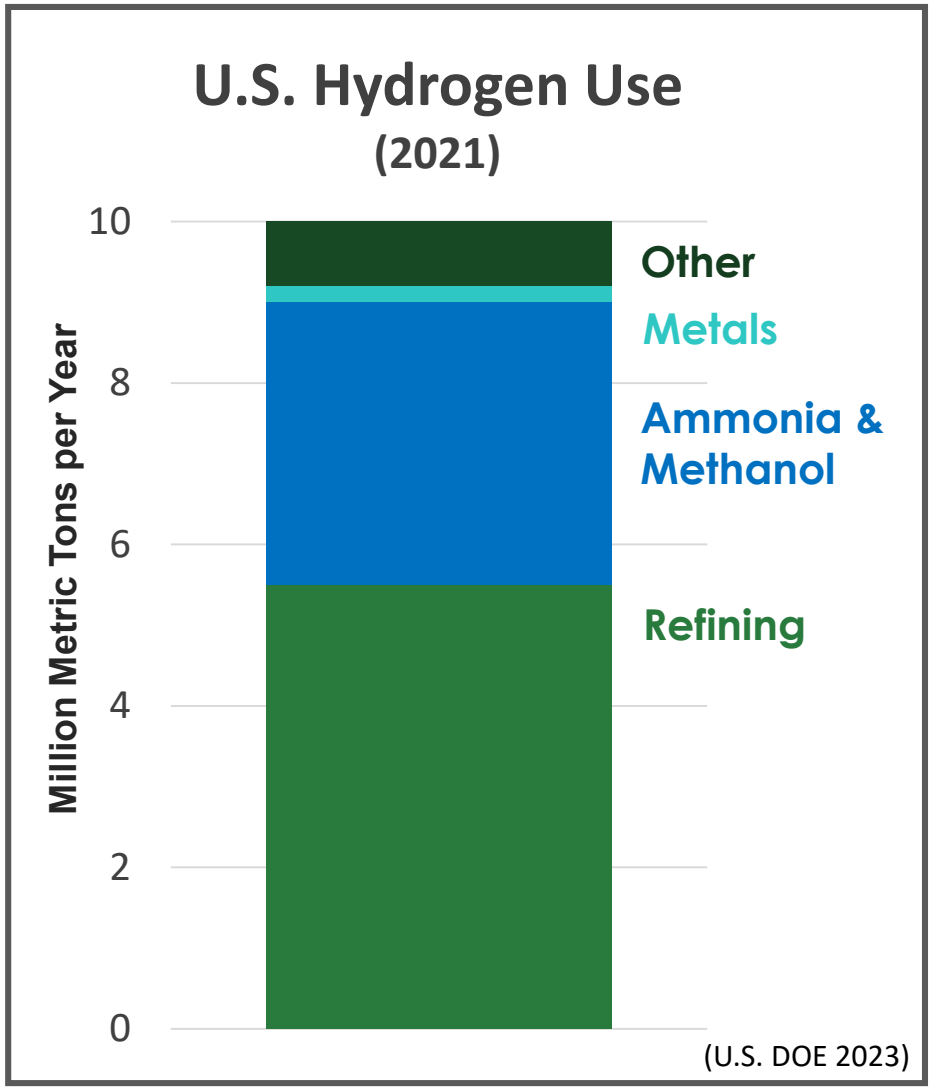
…~**535 terawatt-hours per year** of new electricity generation

Hydrogen Production



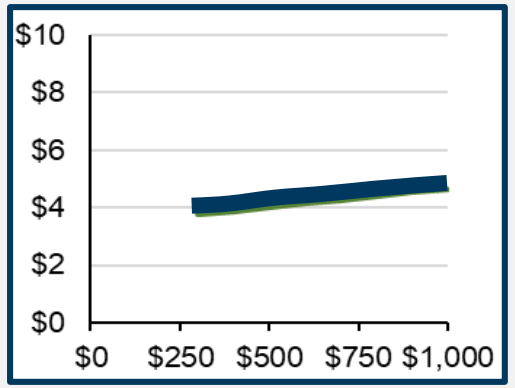


Hydrogen Production

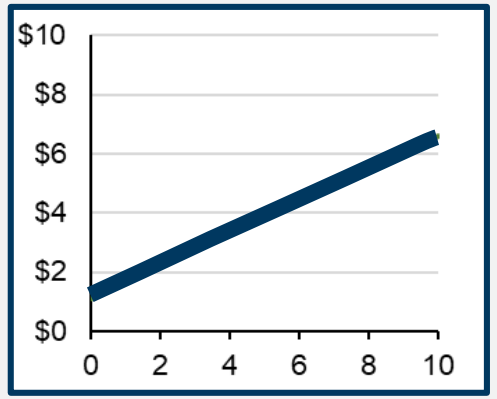


Electrolytic H_2 Production Cost Sensitivities ($/kg)

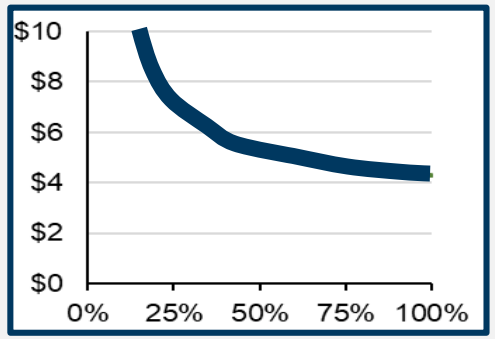
Capital Cost ($/kW)



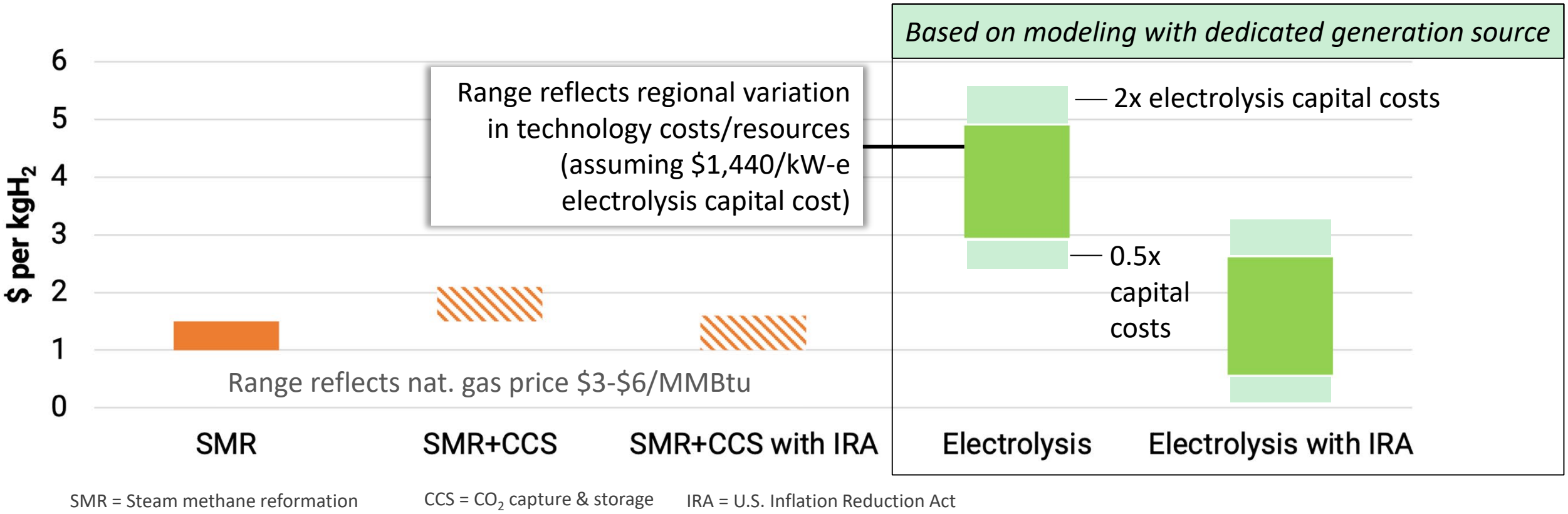
Electricity Price (¢/kWh)



Capacity Factor %



Initial estimates of U.S. IRA hydrogen price impacts



SMR = Steam methane reformation CCS = CO_2 capture & storage IRA = U.S. Inflation Reduction Act

Incentives for zero-carbon electrolysis provide a potential pathway for costs lower than natural gas reforming

Many Publicly Available Resources Available

Hydrogen Safety

CENTER FOR Hydrogen SAFETY

https://www.aiche.org/chs

HydrogenTools

https://h2tools.org

Hydrogen Modeling & Analysis

GREET LIFE-CYCLE MODEL

https://greet.es.anl.gov

H2FAST

H2FillS

https://www.nrel.gov/hydrogen/data-tools.html

Hydrogen Outreach & Education

INCREASE YOUR H2IQ hydrogen.energy.gov

https://www.energy.gov/eere/fuelcells/increase-your-h2iq

Justice40 Initiative

https://www.energy.gov/diversity/justice40-initiative

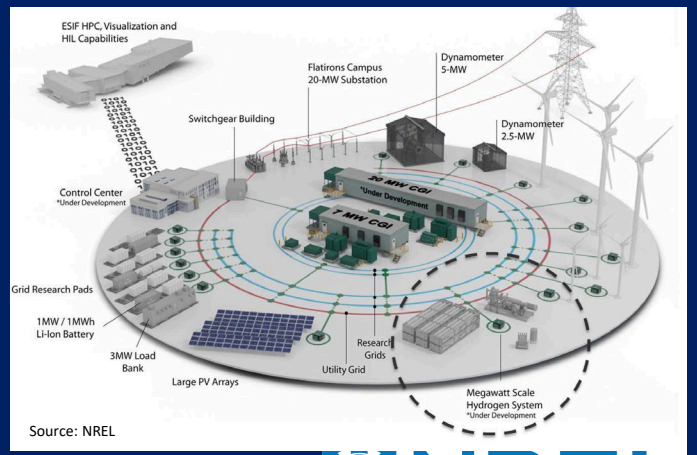
Small selection of publicly-available resources – many more examples exist

Example Hydrogen Demonstration Projects

PRODUCTION

Renewables + Electrolyzer Flexibility

- Operate 1.25 MW PEM electrolyzer
- Develop system characterization and monitoring guidelines



NREL Transforming ENERGY

STORAGE & DELIVERY

Hydrogen Infrastructure

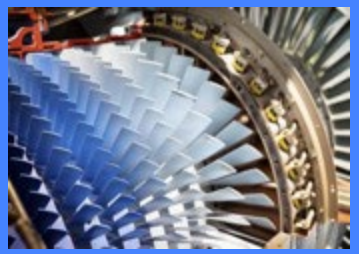
- Evaluate natural gas pipeline infrastructure hydrogen compatibilities
- Characterize benefits, risks, and costs of blending hydrogen

HyBlend U.S. DEPARTMENT OF ENERGY

END USE

Technology Adoption Tests

- On-road and off-road transportation fueling
- Blending with natural gas for power generation
- Microgrid integration
- Industrial heating and processing
- Leak detection sensors



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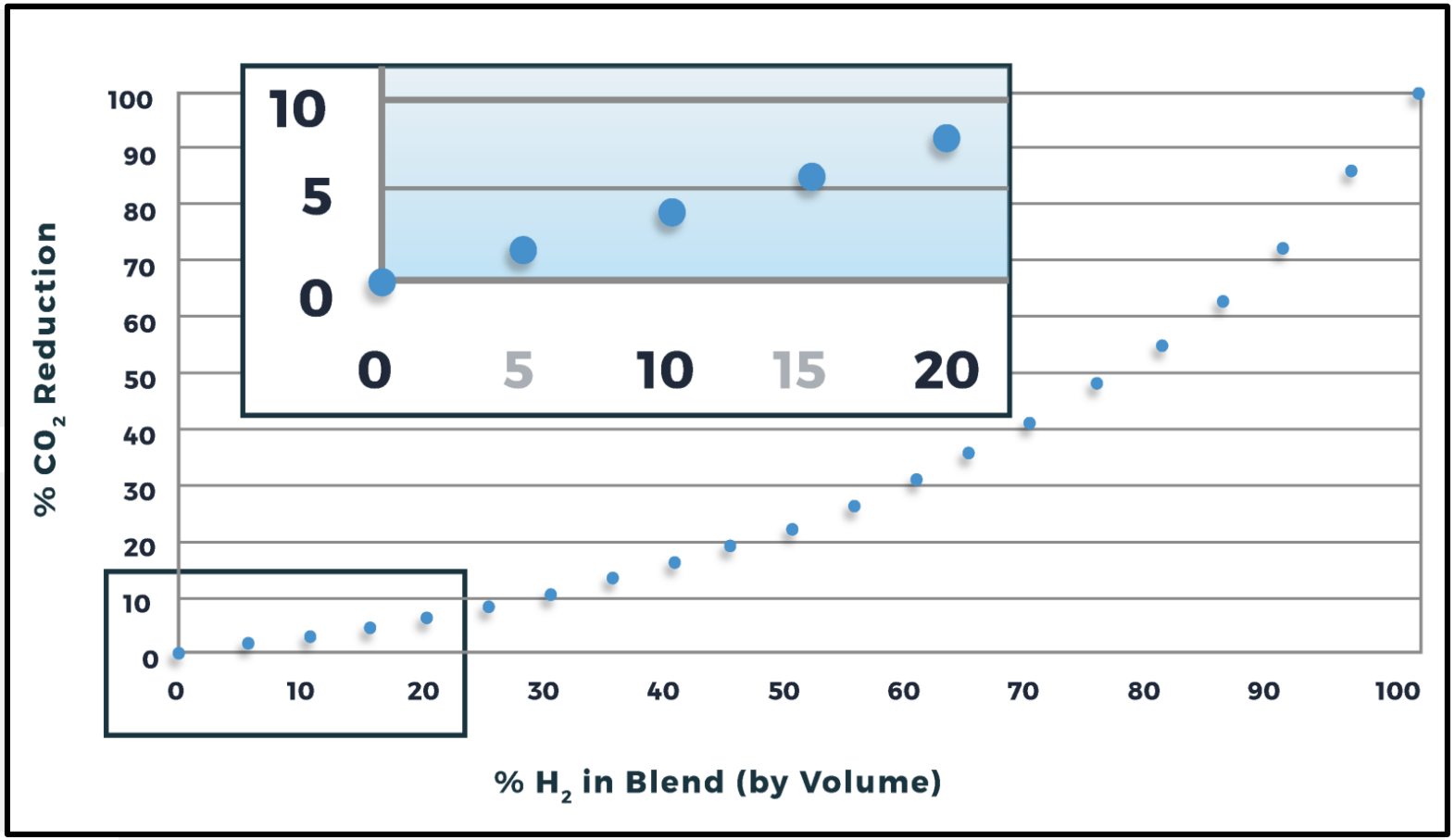
Hydrogen Blending and Impact on CO_2 Emissions

CO_2 Reduction Potential for Blends of Hydrogen and Natural Gas
(relative to use of 100% Natural Gas by volume)

Blending hydrogen with NG is not an equivalent reduction in CO_2 emissions from end use applications



20% by volume hydrogen in U.S. natural gas consumption

Would require ~**15 MMton hydrogen**

Resulting in ~**90 GW electricity** demand from electrolysis

Testing Hydrogen for Power Generation

Hydrogen Testing Objectives

- Operate unit without major modifications
- Measure impacts on CO_2, NOx, CO, and unit performance
- Develop best practices for hydrogen blending

NEW YORK STATE OF OPPORTUNITY. | NY Power Authority

44%v | GE LM6000
(45 MWe - Aeroderivative)

Executive Summary report

Georgia Power

20.9%v | Mitsubishi 501G
(265 MWe – Heavy Frame)

White Paper report

WEC Energy Group

25%v | Wärtsilä RICE
(18 MWe – RICE)

Executive Summary report

Constellation.

38%v | Siemens SGT6-6000G
(246 MWe – Heavy Frame)

Press Release

An Integrated Look at Scale

Low-Carbon Generation

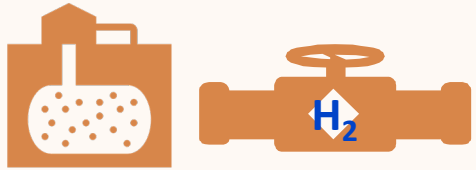
Renewables

Nuclear

Electrolyzer

Electrolysis

Transport & Storage



Underground Storage

Pipelines

Generation

Gas Turbines

~160 GW of gas turbines incorporate blending

Blending at:
30% by volume
96% by volume

(average 60% capacity factor)

An Integrated Look at Scale

Low-Carbon Generation

Renewables

Nuclear

Electrolyzer

Electrolysis

Hydrogen Production

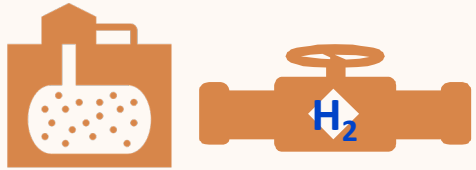
@ 30%: 6 MMT H_2

@ 96%: 46 MMT H_2

~70 MMton produced today globally

~1GW of electrolyzers installed – the largest is 150 MW

Transport & Storage



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An Integrated Look at Scale

Low-Carbon Generation

Renewables Nuclear

New Demand

@ 30%: 40 GW

@ 96%: 325 GW

Producing enough hydrogen for 96%v blend would consume 99% of all solar, wind, & nuclear electricity today

Electrolyzer

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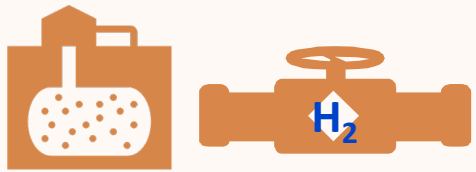

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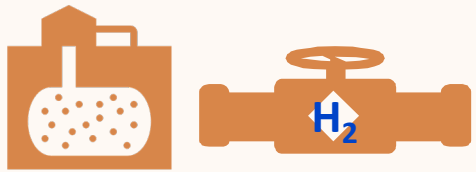


Underground Storage Pipelines

Hydrogen Storage

@ 30%: 56% of salt cavers

@ 96%: 430% of salt cavers

Assumes 8.4% of annual demand is stored (aligned with current NG practices)

Technical feasibility of underground storage is estimated at ~9.8 MMT H_2 storage. This includes salt caverns (mature), aquifers and depleted reservoirs (developing).

Generation

Gas Turbines

~160 GW of gas turbines incorporate blending

Blending at:
30% by volume
96% by volume

(average 60% capacity factor)

THE ENERGY TRANSFORMATION

Accelerating towards clean, affordable, reliable, and resilient energy for everyone.

OPTIONALITY

Leveraging the full portfolio of existing and emerging energy resources while accounting for regional differences

INNOVATION

Developing and deploying innovative solutions across the clean energy economy

COLLABORATION

Reaching across industry and government to align technology development and deployment with customer needs

Attachment 2

State of Florida

Public Service Commission

CAPITAL CIRCLE OFFICE CENTER • 2540 SHUMARD OAK BOULEVARD
TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: June 26, 2023

TO: Braulio L. Baez, Executive Director

FROM: Cayce H. Hinton, Director, Office of Industry Development and Market Analysis
Mark Long, Public Utilities Supervisor, Office of Industry Development & Market Analysis
Jeff Bates, Research Associate, Office of Industry Development & Market Analysis
Eric Wooten, Public Utility Analyst III, Office of Industry Development & Market Analysis
Shelby Nave, Public Utility Analyst II, Office of Industry Development & Market Analysis

CH

RE: Draft of the Report on the Status of Competition in the Telecommunications Industry

CRITICAL INFORMATION: Please place on the July 11, 2023 Internal Affairs. FPSC approval of draft report is sought. Report is due to the Governor and Legislature by August 1, 2023.

Section 364.386, Florida Statutes, requires that the Commission prepare an annual report on the status of competition in the telecommunications industry. The report is to be submitted to the Governor, the Speaker of the House of Representatives, the President of the Senate, and the majority and minority leaders of the Senate and the House of Representatives by August 1 of each year. The attached draft report on the "Status of Competition in the Telecommunications Industry" has been prepared to fulfill the legislative requirement. Staff is seeking approval of the draft report.

Attachment

cc: Mark Futrell, Deputy Executive Director, Technical
Apryl Lynn, Deputy Executive Director, Administrative
Keith Hetrick, General Counsel

Report on the

Status of Competition in the Telecommunications Industry

AS OF DECEMBER 31, 2022

Florida Public Service Commission

Table of Contents

List of Tables iv
List of Figures iv
List of Acronyms v
Executive Summary 1
Chapter I. Introduction and Background 3
A. Federal Regulation 3
B. Florida Regulation 6
C. Status of Competition Report 8
Chapter II. Wireline Competition Overview 10
A. Incumbent Carriers 10
B. Wireline Trends in Florida 11
C. Wireline Market Mix, Market Share, and Market Composition 12
1. Market Mix 12
2. Market Share 12
3. Market Composition 13
4. Residential Wireline Access Line Trends 14
5. Business Wireline Access Line Trends 15
Chapter III. Intermodal Competition Overview 17
A. Wireless 18
1. Market Share 18
2. Wireless Substitution 19
3. Florida Trends 20
4. New Technology 21
B. Voice over Internet Protocol (VoIP) 22
1. National Market 23
a. Facilities-Based VoIP Providers 24
b. Over the Top VoIP Providers 25
2. Florida Market 25
Chapter IV. Competitive Market Analysis & Statutory Issues 27
A. Statutory Issue – Competitive Providers 27
B. Statutory Issue – Consumers 28

C. Statutory Issue – Affordability & Reliability 28
D. Statutory Issue – Carrier Disputes 29
Chapter V. State Activities 30
A. Intercarrier Matters 30
B. Numbering Resources 31
C. Lifeline 32
D. Telecommunications Relay Service 33
Chapter VI. Federal Activities 33
A. Mergers and Acquisitions 33
1. CenturyLink/Lumen Technologies & Apollo 33
2. BullsEye & Lingo Entities 34
B. Broadband Deployment 34
C. Universal Service 37
1. High Cost 38
2. Schools and Libraries 40
3. Low Income 41
4. Rural Health Care 41
D. Public Safety 43
1. Emergency Response 43
2. COVID-19 44
Appendix - List of Certificated ILECs and CLECs as of 12/31/2022 46
Glossary 51

List of Tables

Table 2-1 Florida Wireline Access Line Comparison 14
Table 3-1 U.S. Interconnected VoIP Subscribership by Customer Type 23
Table 5-1 Florida Lifeline Eligibility and Participation Rate 33
Table 6-1 Federal Universal Service Payments and Contributions in Florida 38

List of Figures

Figure 1-1 Early Network, Circa 1900 3
Figure 2-1 Florida Wireline Access Line Trends 12
Figure 2-2 Florida Residential & Business CLEC Market Share 13
Figure 2-3 Florida Residential Wireline Trends by ILECs and CLECs 15
Figure 2-4 Florida Business Wireline Trends by ILECs and CLECs 16
Figure 3-1 U.S. Wireless Market Share, Fourth Quarter 2022 19
Figure 3-2 U.S. Wireless Substitution Rates 20
Figure 3-3 U.S. Retail Voice Telephone Subscriptions 24
Figure 3-4 Florida Residential Interconnected VoIP Subscribers 26
Figure 3-5 Florida Business Interconnected VoIP Subscribers 27
Figure 4-1 Telephone Service Subscription: Florida vs. Nation 29
Figure 6-1 Areas in Florida Eligible for Phase I Rural Digital Opportunity Fund 39
Figure 6-2 School and Libraries Funding Disbursements in Florida 41
Figure 6-3 Rural Health Care Funding Disbursements in Florida 42

List of Acronyms

ACP	Affordable Connectivity Program
CDC	Centers for Disease Control and Prevention
CLEC	Competitive Local Exchange Company
ETC	Eligible Telecommunications Carrier
FCC	Federal Communications Commission
FPSC	Florida Public Service Commission
F.S.	Florida Statutes
ICC	Interstate Commerce Commission
ILEC	Incumbent Local Exchange Company
IP	Internet Protocol
LTE	Long Term Evolution
Mbps	Megabits per second
NANPA	North American Numbering Plan Administrator
NCHS	National Center for Health Statistics
NPA	Numbering Plan Area
OTT	Over the top
PSTN	Public Switched Telephone Network
RDOF	Rural Digital Opportunity Fund
TDM	Time Division Multiplexing
UNE	Unbundled Network Elements
USF	Universal Service Fund
USAC	Unversal Service Administrative Company
VoIP	Voice over Internet Protocol

Executive Summary

Section 364.386, Florida Statutes, requires the Florida Public Service Commission (FPSC or Commission) to submit a report on the status of competition in the telecommunications industry to the Legislature by August 1 of each year. As of December 31, 2022, there were 10 incumbent local exchange companies (ILECs) and 239 competitive local exchange companies (CLECs) certificated by the Commission to operate in Florida.

In 2022, the Florida wireline market continued to follow the national trend with AT&T, CenturyLink and Frontier all experiencing access line losses. The local and national markets continued to consolidate with several mergers and acquisitions. Several intrastate issues were resolved or initiated in 2022. Lifeline subscriptions in Florida rose to 300,285 households in 2022, a 9.7% percent increase.

Consumers in Florida continue to migrate from traditional switched wireline service to wireless and cable/Voice over Internet Protocol (VoIP) services. Carriers reported approximately 900,000 total wireline access lines in Florida for 2022, about 19.5 percent fewer than the previous year. Residential and business wirelines both experienced significant drops in 2022.

Total residential access lines declined 16.5 percent. The transition to VoIP and wireless-only services continues to be responsible for much of this decline. For the fourth year in a row, AT&T edged CenturyLink as Florida's largest residential access line provider. AT&T experienced a 17.4 percent decline in residential lines during 2022 while CenturyLink declined 17.8 percent. Frontier again experienced the biggest residential loss with a 23.7 percent decline in residential access lines during the same period.

For the 12th year in a row, total business access lines exceeded total residential access lines; however, total business access lines declined 21.3 percent in 2022. More than half of AT&T's and Frontier's wireline subscribers were business lines, while CenturyLink's business wireline subscribers made up less than half of its total access line amounts. Over 98 percent of CLEC access lines were business lines, although their total business market share declined to 29 percent in 2022.

As reported for the past several years, intermodal competition from wireless and VoIP services continued to drive the telecommunications markets in 2022. According to the most recent data from the Federal Communications Commission (FCC), there are nearly 23 million wireless subscriptions in Florida, and nearly 4.6 million VoIP connections, far eclipsing the 900,000 remaining wireline access lines in 2022.

Analysis of the telecommunications data obtained by the Commission produced the following conclusions:

- Many CLECs reported offering a variety of services and packages comparable to those offered by ILECs. Subscribers to wireless and business VoIP services continued to increase while cable, residential VoIP and switched access lines decreased. These factors

contribute to the conclusion that competitive providers are able to offer functionally equivalent services to both business and residential customers.

- The traditional wireline market continues to decrease; however, the population of Florida and the need for telecommunications services continues to expand. Wireless subscription growth and VoIP are meeting the increased demand for service. Consumers are choosing to obtain a majority of wireless and VoIP subscriptions from competitors. Given the decline in the traditional wireline market and competitors' substantial wireless and VoIP market shares, consumers are able to obtain functionally equivalent services at comparable rates, terms, and conditions.

- A competitive market requires comparable affordability and reliability of service. The vast majority of Florida households subscribe to telephone service. Consumers are willing and able to choose telecommunications service from competitors using a variety of technologies, so competitors have been maintaining significant market share over an extended period. Based on competitors' substantial market share and market pressures requiring comparable affordability and reliability, competition is having a positive effect on the maintenance of reasonably affordable, reliable telecommunications services.

Chapter I. Introduction and Background

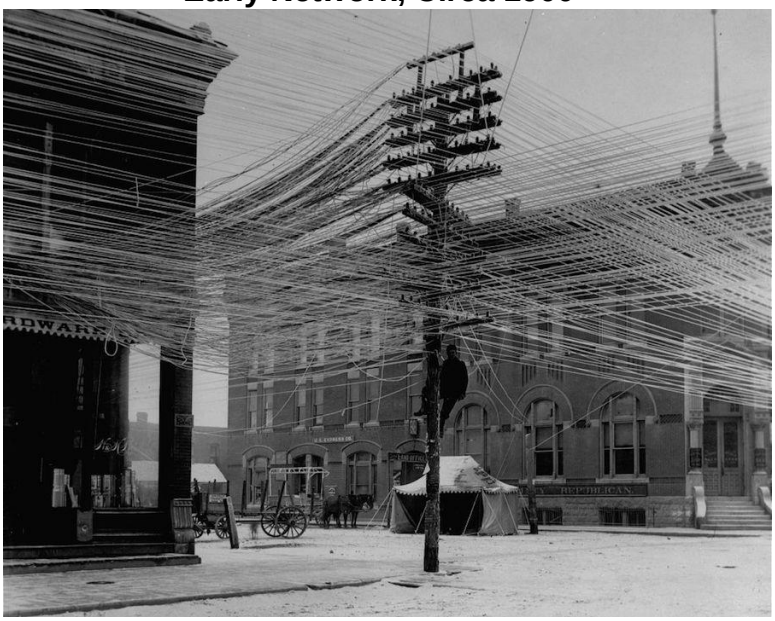
Telephone service has been regulated to some degree nearly since the moment the technology was patented by Alexander Graham Bell (Bell) in 1876.[1] This section summarizes the major historical regulatory events both at the federal and state levels. For the purposes of this report, the history of federal telecommunications regulation is useful because state regulation of these markets has always been intertwined with, and largely a derivative of, federal laws and rules.

A. Federal Regulation

When Bell's patents expired in 1894, competitors were allowed to build their own facilities. This accelerated the development of the nationwide telephone network. In the 18 years Bell held the patents, the average daily calls per 1,000 population peaked at 37. In the first 15 years of competition it increased tenfold.[2] Competitors gained over 50 percent market share by 1907.[3]

Early competition also had its drawbacks. Populated areas saw many lines crisscrossing the streets as competitors raced to build their independent networks. Figure 1-1 shows the lines in Pratt, Kansas circa 1900.

Figure 1-1
Early Network, Circa 1900



Source: America calling: a social history of the telephone to 1940

[1]Diane Katz and Theodore Bolema, "Crossed Lines: Regulatory Missteps in Telecom Policy," Mackinac Center, December 3, 2003, https://www.mackinac.org/6033, accessed June 21, 2023.

[2]Adam D. Thierer, "Unnatural Monopoly: Critical Moments in the Development of the Bell System Monopoly," Washington, D.C.; *The Cato Journal*, Vol. 14, No. 2, (Fall 1994), p. 270, https://www.cato.org/sites/cato.org/files/serials/files/cato-journal/1994/11/cj14n2-6.pdf, accessed June 21, 2023.

[3]Ibid.

Bell's American Telephone and Telegraph Company (AT&T) responded to this competition by acquiring its competitors' networks. Once it had acquired enough rivals to control a market, it would refuse to interconnect with any independent providers.[4] AT&T even acquired a controlling interest in its chief rival, The Western Union Telegraph Company (Western Union). These actions eventually got the attention of federal antitrust lawyers and the Interstate Commerce Commission (ICC), which received authority to regulate telephone service in 1910.[5]

In 1913, AT&T reached a settlement with the Department of Justice. AT&T agreed to divest its Western Union stock, interconnect with other companies, and not acquire any more independent companies without approval from the ICC.[6] This began a decades-long practice by AT&T where, after pressure from potential competitors, courts, or regulators, AT&T would enter into agreements with state and/or federal authorities in order to maintain its control of the national telephone market.[7]

By the 1920s, AT&T had sold the idea of telecommunications as a necessary "universal service" and a "natural monopoly" to state and federal regulators, who in turn discouraged or outright banned competitive telephone services.[8] During this period, AT&T repeatedly agreed to be subject to heavy, rate-restricted regulation in exchange for a guaranteed monopoly in a particular area.[9] AT&T's market share rebounded during this period until it controlled nearly 80 percent of the national market.[10]

Telephone regulation then looked a lot like today's electric regulation. The local telephone markets were considered monopolies and were rate-of-return regulated. Companies submitted cost information, regulators established their rate base and a revenue requirement, and the companies' rates were set to recover that amount. This became the de facto regulatory regime at both the federal and state levels.

By enacting the Communications Act of 1934 (1934 Act) as part of President Roosevelt's New Deal, Congress created a new agency, The Federal Communications Commission (FCC), and

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[4]Richard Gabel, "The Early Competitive Era in Telephone Communication, 1893-1920," 34 *Law and Contemporary Problems*, Vol. 34, No. 2, (Spring 1969), p. 350, https://scholarship.law.duke.edu/lcp/vol34/iss2/8, accessed June 21, 2023.

[5]Frank Dixon, "The Mann-Elkins Act, Amending the Act to Regulate Commerce," *The Quarterly Journal of Economics*, Oxford University Press, vol. 24, no. 4, (August 1910), p. 596, https://www.jstor.org/stable/pdf/1883490.pdf, accessed June 21, 2023.

[6]Milton Mueller, "Universal Service: Competition, Interconnection and Monopoly in the Making of the American Telephone System," Syracuse University, 2013, pp. 127-128, https://surface.syr.edu/books/18, accessed June 21, 2023.

[7]Matthew Lasar, "How AT&T Conquered the 20th Century," *Wired*, September 3, 2011, https://www.wired.com/2011/09/att-conquered-20th-century/, accessed June 21, 2023.

[8]Ibid.

[9]Ibid.

[10]Ibid.

transferred to it the ICC's telecommunications jurisdiction.[11] The new law enabled the FCC to codify its rate-of-return regulation of AT&T while also protecting AT&T's monopoly market position.[12] This regulatory regime continued for several decades, allowing AT&T to grow into the largest corporation in the world. At its peak, AT&T became larger than most countries' economies, and larger than the five largest U.S. oil companies combined.[13]

Starting in the 1950s, cracks in the monopoly regime began to develop, and AT&T's ability to negotiate its way out of competition began to erode, first with the courts, and eventually with the FCC itself. Federal proceedings and lawsuits with nicknames such as "Hush-A-Phone," "Carterfone," and "Above 890" forced AT&T to interconnect with competitors' telephone equipment, wireless radio phones, and microwave networks.

Still, AT&T remained the largest corporation in the world when the federal government filed another antitrust suit in 1974. This action led AT&T to enter into one final agreement; this time to break itself up into smaller companies. The long distance and equipment markets had slowly become competitive and would soon be federally deregulated. AT&T offered to divest itself into eight major companies: seven regional Bell Operating Companies were established to continue the local monopolies, and AT&T, while barred from providing local service, remained as a competitor in the long distance and equipment markets.[14] This action, known simply as Divestiture, became final in 1984, and as a result AT&T's size dropped 70 percent.

Between 1984 and the 1990s, technology continued to put pressure on the local and long distance telephone markets. Cable, cellular, and broadband services all showed promise as substitutes for traditional phone service. Divestiture had created the opportunity for Congress to rewrite the 1934 Act to accommodate these technologies and open the local markets to competition.

Congress passed the Telecommunications Act of 1996 (1996 Act), rewriting the majority of the 1934 Act and setting up the ground rules for local competition.[15] The new law encouraged local competition nationwide, and required massive rulemakings from both the FCC and state regulators to ensure wholesale prices, consumer protections, and universal service principles were fair and reasonable.[16] This effectively ended rate-of-return regulation for the vast majority of local telephone services nationwide.

Congress delegated to the FCC and the States the ability to write rules implementing the 1996 Act. Carriers were required to interconnect with one another, and the existing companies, called ILECs, were required to lease elements of their networks to the new competitors, called CLECs. Wholesale rates for these Unbundled Network Elements (UNEs) had to be established at the state

[11]Communications Act of 1934, Pub. L. No. 73-416, 48 Stat. 1064.

[12]Ibid.

[13]Ray Horak, *Webster's New World Telecom Dictionary*, Wiley Publishing, Indianapolis, Indiana, 2008, p. 42.

[14]*United States v. American Tel. and Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1982).

[15]"Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56.

[16]Ibid.

level using a specific and complicated cost methodology. Small, rural, independent ILECs could escape the voluminous interconnection rules if they could demonstrate to the state utility commission that they could not implement the rules or if there was no demand by competitors in their area.[17]

Companies were encouraged to negotiate interconnection agreements, adopt another company's agreement, or resell a complete service. A process was also established for the regulator to step in should disagreements between companies require arbitration. While the FCC was responsible for establishing the national framework for executing the 1996 Act, it took several years for the States and the FCC to complete the initial implementation of the 1996 Act.

While Congress hoped that the 1996 Act would settle the endless litigation in the telecommunications market, the opposite proved true. The FCC's attempts to implement the interconnection and UNE access provisions were struck down, at least in part, no fewer than three times by federal courts. Finally, four tries and over eight years after the 1996 Act was passed, the FCC's "Triennial Review Remand Order" was issued.[18] The Triennial Review Remand Order, following directives from the courts, limited CLEC access to several UNEs where competitive alternatives existed, as well as local loops combined with local switching, known as the UNE Platform. The UNE Platform was the primary method non-cable CLECs used to provide residential service. Once the courts struck down UNE Platform access, CLECs essentially abandoned the residential market to cable and wireless companies.

B. Florida Regulation

While all this activity was occurring at the federal level, state actions were just as busy. The Florida Legislature added telephone and telegraph regulation to the Florida Railroad Commission's responsibilities in 1911.[19] The agency's name was changed to the Florida Public Service Commission (FPSC or Commission) in 1965.

As previously described, rate-of-return regulation was the norm up through the 1980s in Florida. In 1990, the Florida Legislature recognized the emerging competitive markets for some telecommunications services provided by local carriers and delegated to the FPSC the authority to, in some circumstances, allow price cap regulation for those services.[20] If the FPSC decided that effective competition existed for a particular service or market, it could allow market conditions to control prices and eliminate rate-of-return regulation for that service or market.[21]

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[17]47 U.S.C. § 251(f).

[18]FCC 04-290, WC Docket No. 04-313, CC Docket No. 01-338, Unbundled Access to Network Elements, Review of Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Order on Remand, released February 4, 2005.

[19]See 1911 Fla. Laws 6186.

[20]Price caps are a regulatory scheme where, instead of regulators limiting a company's percent return on investment, a company could elect to have its prices capped at a regulator-approved level, allowing the company to keep any profits generated by selling its services at or below the price caps.

[21]See 1990 Fla. Laws 244.

Competition for more services developed and, by 1995, the emergence of cable companies made it obvious that competition for all local services was inevitable. In anticipation of a federal law becoming imminent, the Florida Legislature passed a sweeping revision to Chapter 364, Florida Statutes (F.S.), finding that "the competitive provision of telecommunications services, including local exchange service, is in the public interest."[22] Competitive entry into the local market was allowed, and CLECs were able to enter subject to a lesser degree of regulatory oversight than ILECs. Also, ILECs were allowed to elect price caps for all their services, eliminating them from rate-of-return regulation altogether.[23] The Legislature also required the FPSC to start publishing this report on the status of competition in Florida.

The Legislature followed up in 1998 by requiring the FPSC to issue a series of five reports on competition, including forward-looking cost estimates of local service, impacts to low-income assistance programs such as Lifeline, the relationships between costs and existing prices, what are fair and reasonable local rates, and impacts on multi-tenant environments.[24]

To further accommodate the growing competitive landscape, in 2003 the Legislature passed another major amendment to Chapter 364, F.S. The changes included lesser FPSC oversight of long distance companies, and ILECs were allowed to petition the FPSC for lesser regulatory oversight, similar to the regulation of their local competitors. It also expanded Lifeline eligibility for low-income Florida consumers, and exempted from FPSC jurisdiction VoIP services, which at that time were largely utilized by cable companies to provide telephone service.[25]

In 2005, the Legislature again amended Chapter 364, F.S., addressing local governments and broadband deployment, FPSC jurisdiction regarding advanced services, Lifeline awareness and participation, and storm damage recovery. The Amendment established rules that governmental entities, such as municipalities, must follow in order to provide communications services (cable, broadband, etc.) in competition with private providers. The 2005 revisions also clarified the FPSC's jurisdiction, or more precisely the exemption from the FPSC's jurisdiction, for advanced services, including wireless, broadband, and VoIP. The new law also further clarified and expanded Lifeline eligibility and procedures. Finally, as a result of the storm season in 2004, it permitted the recovery of costs and expenses related to damage caused by named tropical storms.[26]

In 2006, carrier of last resort obligations in multitenant environments were amended, and some previously enacted rate requirements were repealed.[27] In 2007, changes included further rate

[22]See 1995 Fla. Laws 403.

[23]Ibid.

[24]See 1998 Fla. Laws 277.

[25]See 2003 Fla. Laws 32.

[26]See 2005 Fla. Laws 107 and 132.

[27]See 2006 Fla. Laws 080.

reductions, rebalancing, and repeals. Also, an automated enrollment process for Lifeline was created, and the ILECs' overall carrier of last resort obligations were allowed to sunset.[28]

In 2009, the definition of basic service was narrowed and regulation for non-basic services was decreased. Service quality oversight for non-basic services was eliminated and company tariffs were no longer required to be filed with the Commission. Lifeline eligibility was again expanded. The Florida Department of Management Services was designated as the agency to oversee broadband deployment in Florida. In 2010, the rate-of-return sections in Chapter 364, F.S., were repealed.[29]

The most recent revision to Chapter 364, F.S., came in 2011, when the deregulation of all retail services by the ILECs was finalized. This included the elimination of rate caps, the consumer protection and assistance duties of the FPSC, and all service quality oversight. It also repealed the previously-enacted storm damage recovery provisions.[30]

Although telecommunications is largely deregulated in Florida at this time, the FPSC still retains authority to monitor intercarrier relations and resolve wholesale disputes, oversee the Lifeline and Florida relay programs, and issue certificates of authority to provide telecommunications service. The FPSC has continuing authority over numbering issues, including area code relief, number conservation, and local number portability. The FPSC also resolves complaints relating to Lifeline, relay service, and payphones.

C. Status of Competition Report

Chapter 364, F.S., requires the Commission to prepare and deliver a report on the status of competition in the telecommunications industry to the President of the Senate, the Speaker of the House of Representatives, and the majority and minority leaders of the Senate and the House of Representatives on August 1 of each year. Section 364.386, F.S., requires that the report address the following four elements:

1. The ability of competitive providers to make functionally equivalent local exchange services available to both residential and business customers at competitive rates, terms, and conditions.

2. The ability of customers to obtain functionally equivalent services at comparable rates, terms, and conditions.

3. The overall impact of competition on the maintenance of reasonably affordable and reliable high-quality telecommunications services.

4. A list and short description of any carrier disputes filed under Section 364.16, F.S.

[28]See 2007 Fla. Laws 029.

[29]See 2009 Fla. Laws 226.

[30]Regulatory Reform Act, ch. 36, 2011 Fla. Laws 1231.

The Commission is required to make requests to local exchange telecommunications providers each year for the data required to complete the report. The data request was mailed on February 24, 2023, to 10 ILECs and 239 CLECs. Responses were due April 17, 2023. The data and analyses that follow accurately reflect the information provided by the ILECs and the reporting CLECs.

This report is divided into chapters that summarize key events and data that may have a short-term or long-term effect on the Florida telecommunications market. Chapter II presents data regarding wireline access line competition in Florida, including access line trends, residential/business access line mix, and market share. Chapter III discusses the continued development of the wireline market's principle forms of intermodal competition: broadband, wireless, and VoIP. Chapter IV primarily uses data outlined in the other chapters to address the four statutory issues delineated above. Chapter V provides a summary of state activities affecting local telecommunications competition in 2022, including intercarrier matters, Lifeline, and the Telecommunications Relay Service. Chapter VI details some of the major federal activities that may affect the Florida market.

Chapter II. Wireline Competition Overview

For the past decade, the technologies used to deliver voice telephony have continued to evolve. Analog circuits using copper wires and Time Division Multiplexing (TDM) are traditionally referred to as switched access lines, or more commonly known by consumers today as landlines. This legacy wireline technology is being replaced by wireless cell-based transmission and VoIP, which is provided via a digital broadband connection, either wireless or wired. Wireless, VoIP, and broadband are all exempt from FPSC jurisdiction. The FPSC is therefore limited in what data it can collect regarding these technologies. Trends in these technologies are summarized in Chapter III.

TDM-based wireline service, which is the primary subject of this report, is still used throughout the country and Florida. In fact, the wireless and broadband networks utilize many of the traditional wireline facilities for interoffice and long distance transport.

This chapter discusses the incumbent carriers' corporate trends as disclosed in their federal financial reports. It then discusses the number, market mix, and market share of residential and business wirelines. Knowledge of the number of wirelines and the trends for market participants is essential to understanding the state of the market.

A. Incumbent Carriers

Florida's ILECs have been experiencing switched access line losses for well over a decade. These losses appear consistent with the companies' national trends reflected in their respective annual reports filed with the Securities and Exchange Commission. There are 10 ILECs providing wireline services in Florida, the largest of which are AT&T, CenturyLink, and Frontier.[31] These companies' annual reports showed that, like in Florida, they continue to face access line losses nationally as customers disconnect traditional landline services and migrate to alternative services.

In Florida, AT&T's switched access lines declined by over 74,000 (18.2 percent) in 2022, with residential access lines decreasing by nearly 31,000 (17.4 percent) and business lines by over 43,000 (18.8 percent).[32] Nationwide, AT&T reported losses of approximately 964,000 switched access lines (15.61 percent). AT&T is the only major ILEC in Florida that reports access line numbers at the national level in its annual reports. Despite the loss of switched access lines, AT&T reported a nearly 2.0 percent increase in operating revenues nationally.[33]

CenturyLink's Florida switched access lines declined over 41,000 (14.6 percent), with residential access lines decreasing nearly 27,000 (17.8 percent) and business access lines decreasing nearly

[31]Responses to local competition data request 2023.

[32]AT&T's response to the local competition data request 2023.

[33]AT&T Inc., "Form 10-K," December 31, 2022, https://otp.tools.investis.com/clients/us/atnt2/sec/sec-outline.aspx?FilingId=16393783&Cik=0000732717&PaperOnly=0&HasOriginal=1, accessed June 21, 2023; responses to local competition data request 2023.

15,000 (11.0 percent).[34] Nationwide, CenturyLink reported operating revenues of approximately $17.48 billion in 2022, reflecting a decline of nearly 11.22 percent from 2021.[35]

Frontier's switched access lines in Florida declined by over 45,000 (30.7 percent), with residential access lines decreasing nearly 9,000 (23.7 percent) and business lines by nearly 37,000 (33.0 percent).[36] Nationwide, Frontier reported 2022 revenue of $5.73 billion, reflecting a decline of 5.68 percent.[37]

The seven rural Florida ILECs experienced a contraction in the number of switched access lines. In 2022, rural carriers in Florida saw their total access lines decline by approximately 6,900 (7.7 percent). Residential lines decreased over 4,600 (7.5 percent) and business lines decreased by nearly 2,300 (8.3 percent).[38]

B. Wireline Trends in Florida

Figure 2-1 illustrates the overall trend in Florida for both residential and business switched access lines. Beginning in 2011, business lines exceeded residential lines. Based on current data, the rate of decline in residential lines moderated, while the rate of decline in business lines accelerated in 2022. Residential access lines totaled nearly 358,000 as of December 2022, representing a decline of 16.4 percent from 2021. Business access lines totaled over 570,000, representing a decline of 21.3 percent from the previous year. Total combined access lines for ILECs and CLECs declined 19.4 percent, from approximately 1.2 million in December 2021 to around 900,000 as of December 2022. Over the past five years, the total number of switched access lines decreased by nearly one million, or 51.5 percent.

[34] CenturyLink/Lumen's response to local competition data request 2023.

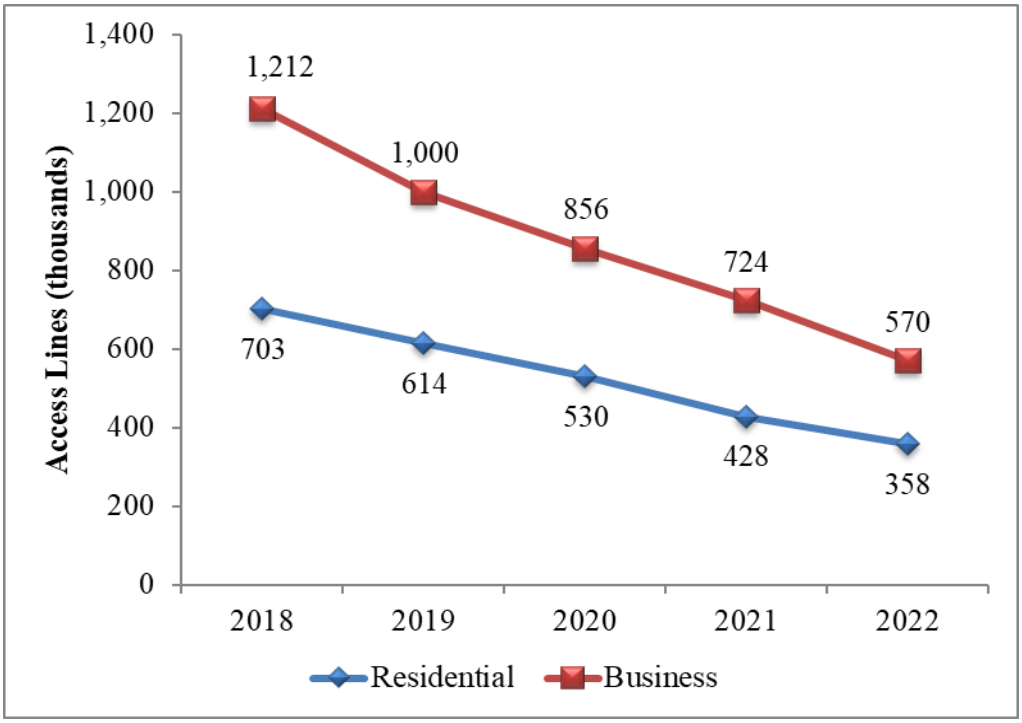
[35]Lumen Technologies, Inc., "Form 10-K," December 31, 2022, https://d18rn0p25nwr6d.cloudfront.net/CIK-0000018926/0507eca4-4505-4239-97de-83829dacd262.html, , accessed on June 21, 2023.

[36]Frontier's response to local competition data request 2023.

[37]Frontier Communications Corporation, "Form 10-K," December 31, 2022, https://d18rn0p25nwr6d.cloudfront.net/CIK-0000020520/ef674170-3193-46d4-a363-784ac8f594dd.html, accessed on June 21, 2023.

[38]Responses to local competition data request 2023.

Figure 2-1
Florida Wireline Access Line Trends



Source: Responses to local competition data request (2019-2023)

C. Wireline Market Mix, Market Share, and Market Composition

1. Market Mix

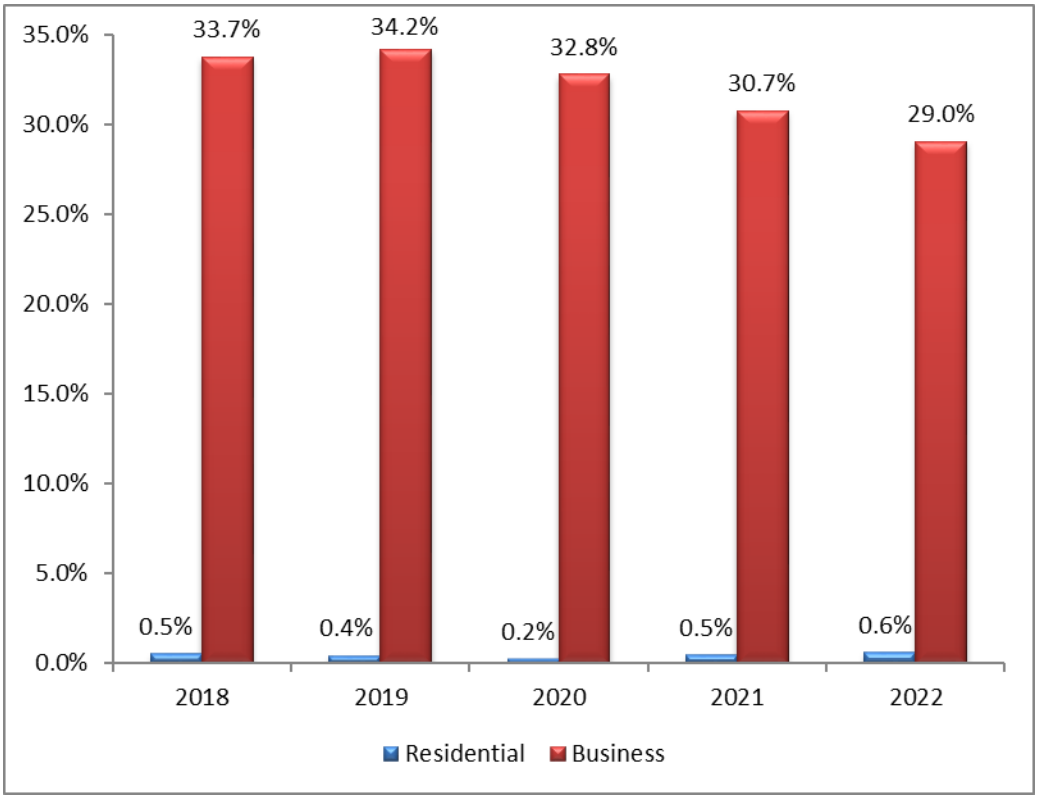
The business-to-residential ratio of customers served by ILECs and CLECs has shifted over time. In general, both ILECs and CLECs have seen an increased concentration of traditional wireline business customers as residential customers migrate to other options. The business-to-residential customer mix for ILECs was about 30 percent business and 70 percent residential in 2004. By 2017, the mix for ILECs had shifted so much that the percentage of business wirelines exceeded the percentage of residential wirelines. In 2022, the ILECs' ratio was 53 percent business lines to 47 percent residential lines.

The shift in mix has been even more pronounced in the CLEC market. In 2004, the business-to-residential customer mix for CLECs was about 63 percent business to 37 percent residential. In 2022, the CLEC customer mix was nearly 99 percent business lines.

2. Market Share

CLECs have traditionally focused more on business customers. Figure 2-2 illustrates FPSC data on CLEC market share by business and residential customer classes. The inverse of this percentage would be market share for the ILECs in Florida. According to FPSC data, the CLEC residential market share increased slightly from 0.5 percent in 2021 to 0.6 percent in 2022, while the CLEC business market share decreased from 30.7 percent in 2021 to 29.0 percent in 2022.

Figure 2-2
Florida Residential & Business CLEC Market Share



Source: Responses to local competition data request (2019-2023)
Note: 2020 data updated from previous report

3. Market Composition

The market composition of access lines served by local exchange companies is illustrated in Table 2-1. In 2022, ILEC residential access lines decreased by 16.7 percent, while ILEC business lines decreased by 19.3 percent. The CLECs experienced a slight increase in the number of residential access lines, but given their small market presence, this yielded a percentage gain of 9.2 percent. CLEC business access lines decreased by 25.6 percent.

Table 2-1
Florida Wireline Access Line Comparison

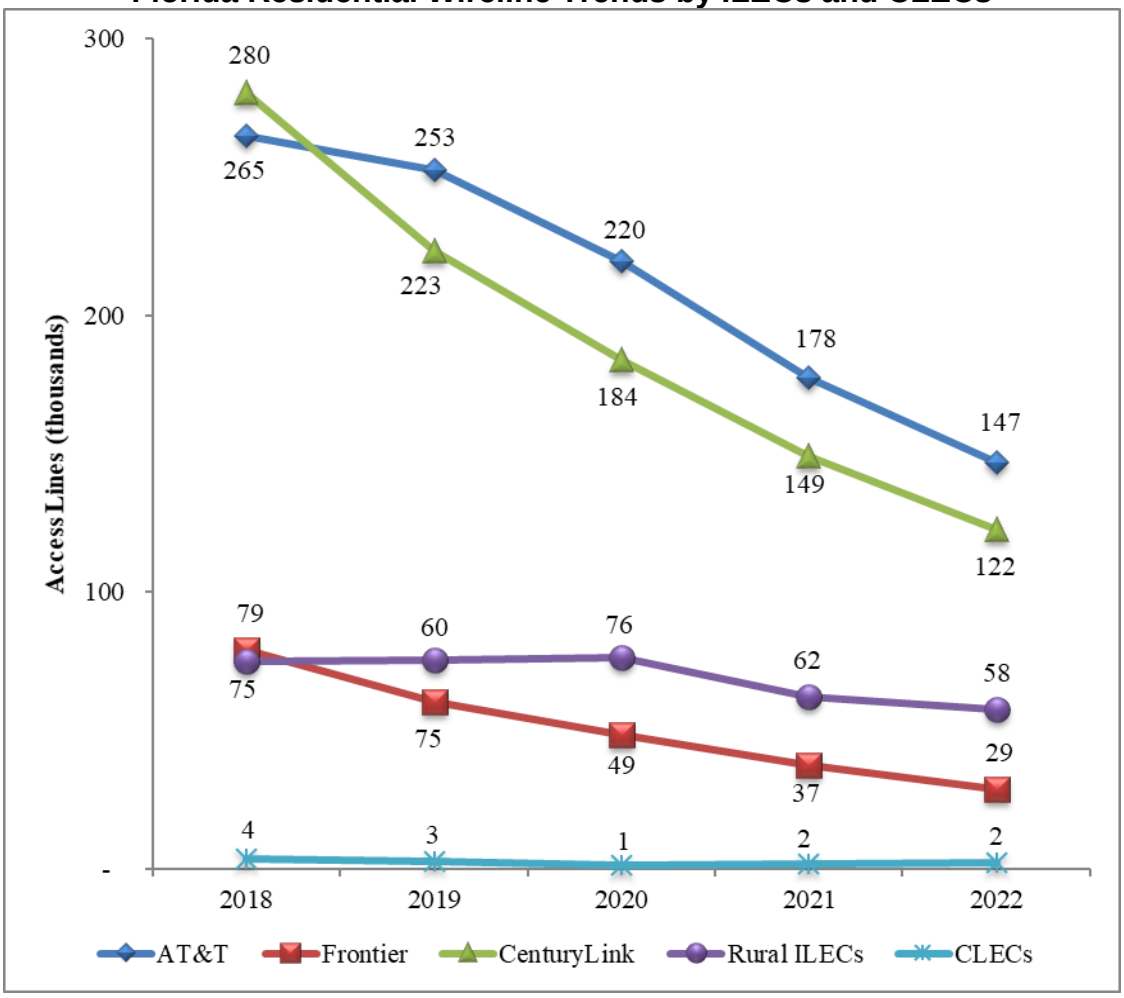
		ILECs	CLECs	Total
2019	Residential	611,329	2,600	613,929
	Business	658,040	341,707	999,747
	Total	1,269,369	344,307	1,613,676
2020	Residential	528,480	1,265	529,745
	Business	575,682	280,541	856,223
	Total	1,104,162	281,806	1,385,968
2021	Residential	426,460	1,971	428,431
	Business	501,370	222,608	723,978
	Total	927,830	224,579	1,152,409
2022	Residential	355,425	2,153	357,578
	Business	404,564	165,519	570,083
	Total	759,989	167,672	927,661
Change 2021-2022	Residential	-16.7%	9.2%	-16.5%
	Business	-19.3%	-25.6%	-21.3%
	Total	-18.1%	-25.3%	-19.5%

Source: Responses to local competition data request (2020-2023)

4. Residential Wireline Access Line Trends

Figure 2-3 displays the wireline residential access line trends separately for AT&T, Frontier, CenturyLink, aggregate rural ILECs, and aggregate CLECs. Over the past five years, AT&T has averaged losses of nearly 15 percent per year. Frontier and CenturyLink exceeded AT&T with average respective losses of approximately 23 percent and 21 percent per year. During that period, rural ILEC access lines declined by an average of over five percent, while CLEC residential lines declined by an annual average of over 14 percent.

Figure 2-3
Florida Residential Wireline Trends by ILECs and CLECs



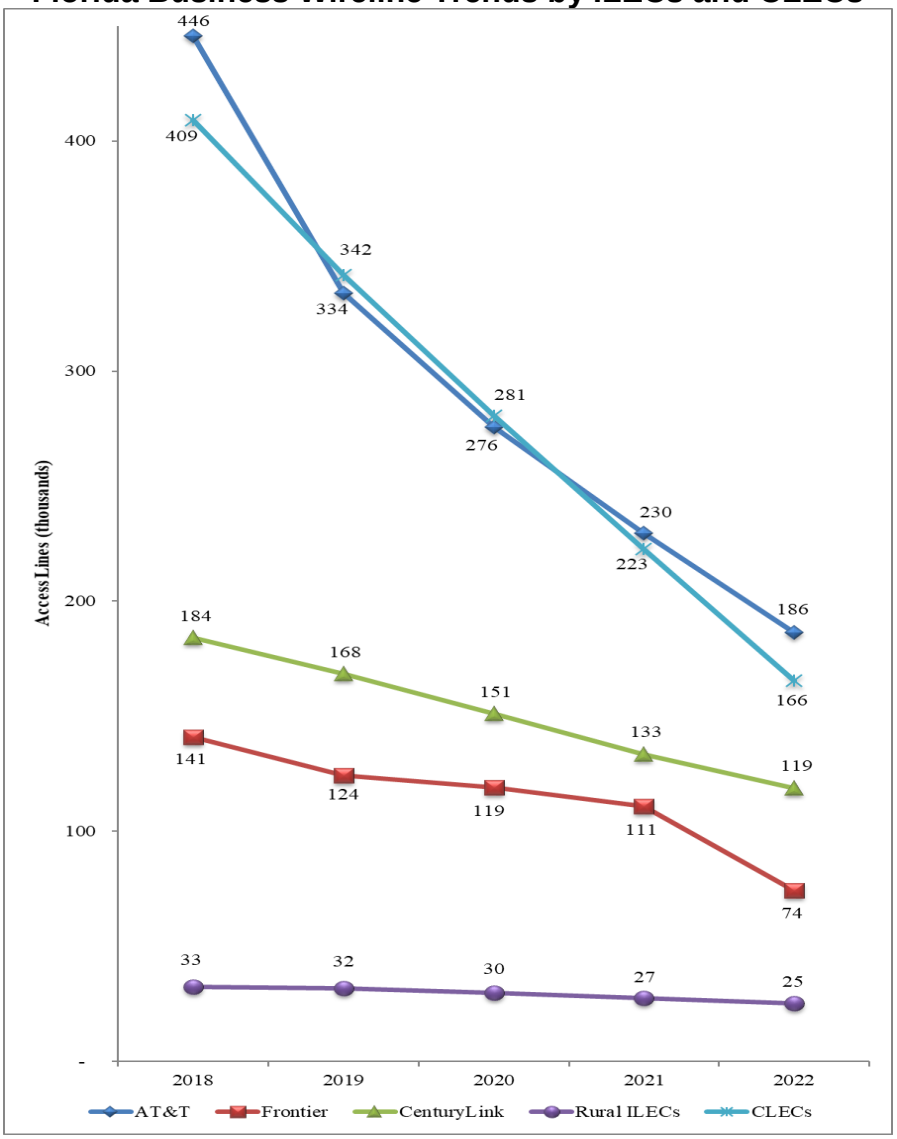
Source: Responses to local competition data request (2019-2023)

AT&T experienced residential wireline losses of 19.2 percent in 2021 and 17.4 percent in 2022. Frontier lost 22.9 percent of its residential wirelines in 2021 and 23.7 percent in 2022, while CenturyLink lost 19.0 percent of its residential lines in 2021 and 17.8 percent in 2022. The rural ILECs reported line losses of 18.2 percent in 2021 and 7.5 percent in 2022, and the CLECs reported residential wireline gains of 55.8 percent in 2021 and 9.2 percent in 2022. The rate of line loss accelerated for Frontier, while all other categories, except for CLECs, experienced a moderation. CLECs reported a moderated increase in residential lines.

5. Business Wireline Access Line Trends

Figure 2-4 displays the wireline business access line levels separately for AT&T, Frontier, CenturyLink, aggregate rural ILECs, and aggregate CLECs. Over the past five years, AT&T has experienced an average decline of over 18 percent per year, while Frontier and CenturyLink have experienced average annual declines of over 17 percent and 12 percent, respectively. The average annual decline in rural ILEC business access lines over the past five years is seven percent, while CLEC business access lines declined by over 22 percent annually over the same period.

Figure 2-4
Florida Business Wireline Trends by ILECs and CLECs



Source: Responses to local competition data request (2019-2023)

During the most recent periods, AT&T experienced business wireline losses of 16.7 percent in 2021 and 18.8 percent in 2022. Frontier lost 6.9 percent of its business wirelines in 2021 and 33.0 percent in 2022, while CenturyLink lost 11.6 percent of its business lines in 2021 and 11.0 percent in 2022. The rural ILECs reported line losses of 8.4 percent in 2021 and 8.3 percent in 2022, and the CLECs reported business wireline declines of 20.7 percent in 2021 and 25.6 percent in 2022. The rate of line loss accelerated for AT&T, Frontier, and the CLECs while CenturyLink and the rural ILECs experienced a moderation in losses.

Chapter III. Intermodal Competition Overview

Total switched access lines in Florida peaked over 20 years ago at approximately 12 million.[39] Florida's population has increased significantly since that time and communications services have continued to expand, yet as previously shown in Table 2-1, access lines decreased to around 928,000 by the end of 2022. So where did over 92 percent of the access lines go?

Wireless companies began attracting customers in the 1980s, and by 1995 there were over 24 million cellular subscribers in the U.S.[40] Cable companies discovered that they could provide telephone service using VoIP and sought authorization from Congress to do so. These pressures resulted in the 1996 Act, which set up rules for these technologies to directly compete with ILECs, as well as companies that wished to compete using the ILECs' own technology and networks. While the ILECs have continued to dominate the traditional wireline markets, demand and competition has exploded for the wireless and VoIP services. These other modes are simply different technological evolutions of telephone service, much as connecting a call through an operator was replaced by direct dialing many decades ago. The additional capabilities available with these technologies have led the vast majority of residential consumers and businesses to make the transition to these modes.

A major development that has attracted many customers to these technologies is the speed and volume of information that can be transmitted. High-speed Internet and data services, generically known as broadband, allow customers to do much more than talk: they can send and receive audio, video, and other large streams of data to meet many of their business and entertainment needs. Broadband facilities not only serve retail customers, but they have also become the backbone of wired and wireless interoffice data transport.

The benefit of real-time broadband services became evident during the recent COVID-19 pandemic. Sportscasters and other announcers needed to be able to remotely broadcast events due to travel restrictions. Historically, long distance interviews have been done via satellite with a noticeable delay between transmission and reception. With broadband, however, sports events were broadcast live with announcers thousands of miles apart. John McEnroe announcing the 2020 French Open tennis tournament from his home office in Malibu, California, nine time zones away, could only be accomplished by using terrestrial broadband facilities that carried his voice across the globe nearly instantaneously.[41]

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[39]Florida Public Service Commission, "Competition in Telecommunications Markets in Florida," Tallahassee, FL, December 2002, p. 21, https://www.floridapsc.com/pscfiles/website-files/PDF/Publications/Reports/Telecommunication/TelecommunicationIndustry/2002.pdf, accessed June 21, 2023.

[40]Statement of Anne K. Bingaman Assistant Attorney General Antitrust Division United States Department of Justice, Submitted to the Subcommittee on Oversight and Investigations United States House of Representatives On Competition in the Cellular Telephone Service Industry, p. 3, October 12, 1995, https://www.justice.gov/sites/default/files/atr/legacy/2015/05/06/0460.pdf, accessed June 21. 2023.

[41]Marc Berman, "Mary Carillo will call French Open remotely amid 'shabby' COVID-19 protocols'" New York Post, September 23, 2020, https://nypost.com/2020/09/23/mary-carillo-will-call-french-open-remotely-amid-covid-19-spike/, accessed June 21, 2023.

A. Wireless

In the early 1990s, wireless service was still new, signal strength and network availability were limited, and the services were marketed primarily to enterprise and other business users. The general population of consumers could not afford the cost of the cellular phone, and the limited availability of network access meant that mass adoption of the platform would take time.

However, as technology became more affordable and easier to upgrade, consumers started to enter the wireless market en masse. Eventually this led to the integration of wireless technology and broadband internet connections. Past reports have consistently shown that adoption of wireless services in the United States, and Florida specifically, far surpasses the adoption of other modes of communications.

1. Market Share

As shown in Figure 3-1, US market share among the top five wireless companies was split with Verizon leading at 33.2% (approximately 114.5 million subscribers), followed by T-Mobile at 32.9% (113.6 million), AT&T at 30.2% (104.0 million), Dish Network at 2.3% (7.9 million), and UScellular at 1.4% (approximately 4.7 million).[42,43,44,45,46]

[42]AT&T Inc. "Form 10-K," February 16, 2022, https://otp.tools.investis.com/clients/us/atnt2/sec/sec-outline.aspx?FilingId=15576872&Cik=0000732717&PaperOnly=0&HasOriginal=1, accessed June 21, 2023.

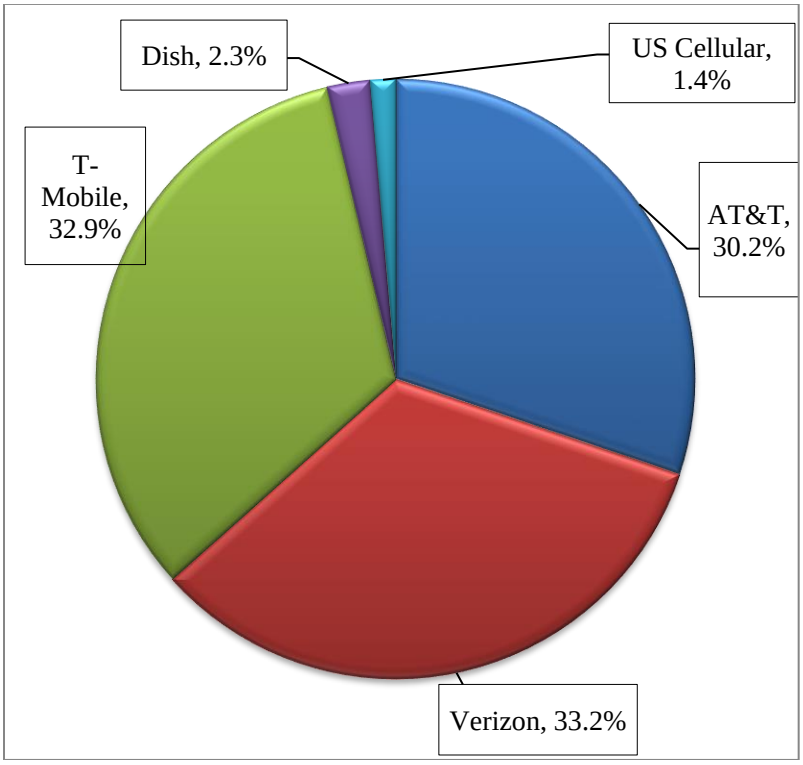
[43]Verizon Communications Inc., "Form 10-K," February 10, 2023, https://verizon.api.edgar-online.com/EFX_dll/EdgarPro.dll?FetchFilingHTML1?SessionID=P-u-k35Whv7uGTQ&ID=16385592, accessed June 21, 2023.

[44]T-Mobile US Inc., "Form 10-K," February 14, 2023, https://d18rn0p25nwr6d.cloudfront.net/CIK-0001283699/ee65def8-2d92-4882-a8c6-e3794b37ffe8.html, accessed June 21, 2023.

[45]DISH Network Corporation, "Form 10-K," February 23, 2023, https://dish.gcs-web.com/node/34501/html, accessed June 21, 2023.

[46]United States Cellular Corporation, "Form 10-K," February 16, 2023, https://d18rn0p25nwr6d.cloudfront.net/CIK-0000821130/ac993502-01fd-414c-a77e-1ae8f77bd4b9.html, accessed June 21, 2023.

Figure 3-1
U.S. Wireless Market Share, Fourth Quarter 2022



Source: Companies' 2022 10K Earnings Reports

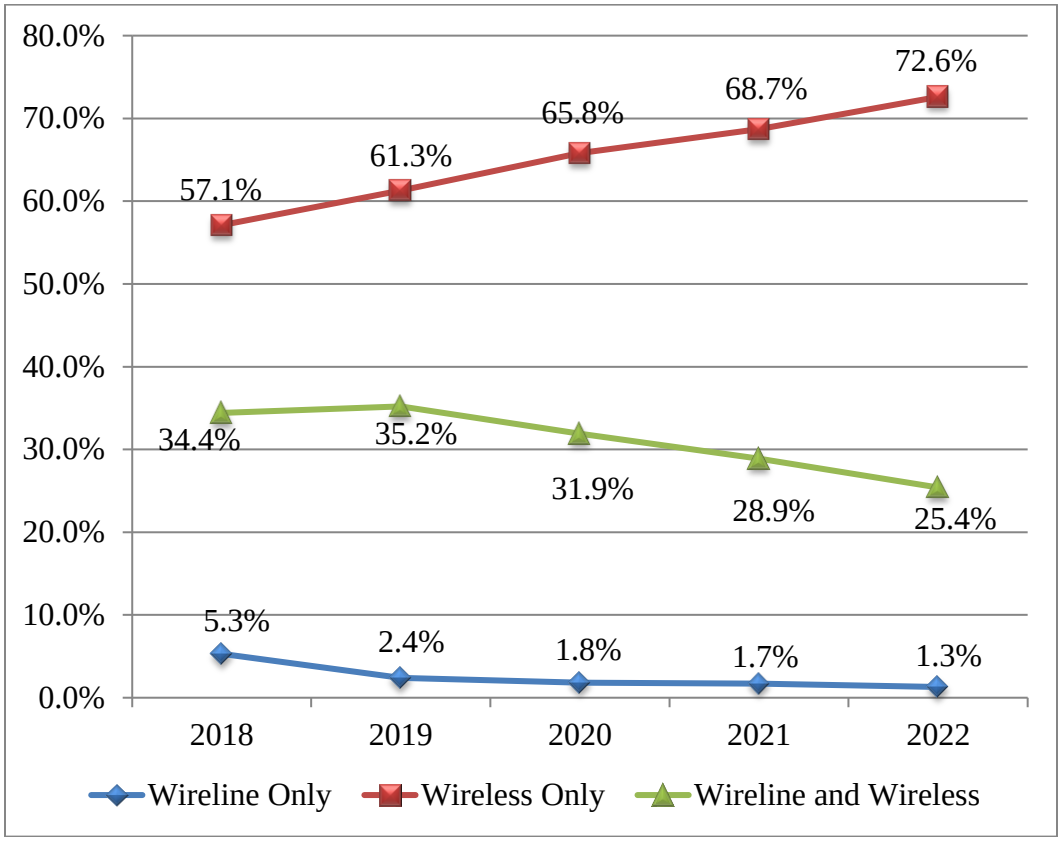
2. Wireless Substitution

According to the most recent data from carriers' financial reports, the five largest wireless service providers in the United States accounted for over 439 million connections by year-end 2022.[47] Less than 30 percent of U.S. households subscribe to both wireline and wireless service. As shown in Figure 3-2, wireless-only households in the United States rose from 68.7 percent in June 2021 to 72.6 percent in 2022.[48]

[47]Companies' 2023 Annual filings with the SEC.

[48]Blumberg SJ, Luke JV. "Wireless substitution: Early release of estimates from the National Health Interview Survey, January-June 2022," National Center for Health Statistics, December 2022, https://doi.org/10.15620/cdc:121999, accessed June 21, 2023.

Figure 3-2
U.S. Wireless Substitution Rates



Source: CDC/NCHS, National Health Interview Survey

3. Florida Trends

Updated information for Florida's wireless trends is not regularly available, but in the past Florida's wireless subscription distribution has tracked closely with national trends. The most recent data available from the FCC, from June 2021, estimated Florida's wireless subscriptions to be 22,817,000. This was an increase of approximately 4.3 percent from June 2020 (21,875,000).[49] Florida's population was estimated at 22,244,823 in 2022, and with over 22.8 million wireless subscriptions in 2021, Florida continues to have more connected wireless devices than people.[50,51]

[49]FCC, "Voice Telephone Services Report, State-Level Subscriptions," released August 1, 2022, https://www.fcc.gov/voice-telephone-services-report, accessed June 21, 2023.

[50]Macrotrends, Florida Population 1900-2022, https://www.macrotrends.net/states/florida/population, accessed June 21, 2023.

[51]Federal Communications Commission, "Voice Telephone Services Report," released August 12, 2022, available from https://www.fcc.gov/voice-telephone-services-report, accessed June 21, 2023.

4. New Technology

The demand for wireless broadband service continues to grow with each new evolution of technology. The fifth generation of wireless connectivity, known as 5G, has brought a more robust broadband experience to wireless services. Advancements made from spectrum auctions aimed at repurposing existing sub-6GHz spectrum such as "C-Band" frequencies are allowing wireless providers to develop new products that will offer 5G speeds in the 50-500 megabits per second (Mbps) range over broader areas. Millimeter wave (mmWave) frequencies, usually near 20GHz and above, will ultimately offer Gigabit and higher speeds, but have a relatively short range and require more expensive equipment, thus at present are best suited for high-density urban areas. Fixed wireless access service (FWA) is a fiber-based last-mile technology that can be easily deployed to provide super high speed broadband services in harder-to-reach service areas.[52]

AT&T's network covers 337 million people with 4G LTE (long-term evolution) and over 285 million with 5G technology in the United States. The company expects to continue investing capital expanding its network capacity and obtaining additional spectrum to meet long term needs.[53]

Verizon is using its low and mid-band spectrum to provide 4G LTE and 5G wireless services. In addition, Verizon is also using low and mid-band spectrum for 5G through Dynamic Spectrum Sharing (DSS) to compliment both C-Band and spectrum licenses in the 28 and 39 GHz band. According to its 10-K annual report, Verizon's C-Band spectrum reached approximately 189 million points of presence by the end of December 2022.[54]

By December 31, 2022, T-Mobile's total 5G coverage covered 325 million people, reaching 98 percent of Americans. Its "Ultra Capacity 5G" utilizing mid-band and MMWave service covered 263 million people by the end of 2022, and its total 5G coverage, including low-band spectrum, covers 325 million people.[55]

Dish Network reached its FCC buildout requirement of providing coverage to 70% of the population by June 14, 2023. In the second half of 2023, the company plans to expand 5G Voice over New Radio (VoNR) over its 5G standalone network.[56] While the company will continue to

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[52]Salvatore Salamone, "Is 5G Fixed Wireless Access the New ISDN?," *Network Computing*, February 4, 2019, https://www.networkcomputing.com/wireless-infrastructure/5g-fixed-wireless-access-new-isdn, accessed June 21, 2023.

[53]AT&T Inc. "Form 10-K," February 13, 2022, https://otp.tools.investis.com/clients/us/atnt2/sec/sec-outline.aspx?FilingId=15576872&Cik=0000732717&PaperOnly=0&HasOriginal=1, accessed June 21, 2023.

[54]Verizon Communications Inc., "Form 10-K," February 10, 2023, https://verizon.api.edgar-online.com/EFX_dll/EdgarPro.dll?FetchFilingHTML1?SessionID=P-u-k35Whv7uGTQ&ID=16385592, accessed June 21, 2023.

[55]T-Mobile US Inc., "Form 10-K," February 14, 2023, https://d18rn0p25nwr6d.cloudfront.net/CIK-0001283699/ee65def8-2d92-4882-a8c6-e3794b37ffe8.html, accessed June 21, 2023.

[56]DISH Network Corporation, "Form 10-K," February 23, 2023, https://dish.gcs-web.com/node/34501/html, accessed June 21, 2023.

rely on its mobile virtual network operator (MVNO) arrangements with T-Mobile and AT&T, it's focused on serving all its customers with its own voice-based service.[57]

UScellular currently offers FWA service over its 5G network that operates on low-band 600 MHz spectrum but will incorporate its mid-band spectrum when it deploys that later this year. The company spent $1.46 billion in 2021 to purchase C-band spectrum licenses that cover 94% of its footprint.[58]

B. Voice over Internet Protocol (VoIP)

VoIP technology utilizes digital computer protocols in order to complete telephony voice calls over the Internet. Interconnected VoIP allows users to make and receive calls between their VoIP networks and the public switched telephone network (PSTN).[59] These calls can be provided via separate interconnected digital channels or "over the top" of existing Internet traffic. Interconnected VoIP is a substitute for traditional TDM-based service, and so is included in this report to the extent information is available. Non-interconnected VoIP services lack the capability of interconnecting with the PSTN and are not considered a substitute for TDM.[60] Non-interconnected VoIP is not discussed in this report.

VoIP providers include cable companies, ILECs, CLECs, and Over the Top (OTT) providers. Customers usually subscribe to a broadband service and lease/purchase telephone equipment from the VoIP provider. Calls are sent through the broadband connection.

OTT companies include Magic Jack, Vonage and Skype. OTT calls can be viewed as interconnected VoIP services because of their ability to connect to internet infrastructure and route calls through the PSTN. These companies require the customer to have a broadband internet connection. Some use plugin converters between the consumer's existing phone and their standard phone jack.

Because VoIP is not regulated in Florida, the FPSC has no direct way to access VoIP access line data. The FPSC therefore estimates residential VoIP from responses to data requests. Florida Internet and Television (FiTV) is able to provide some information on residential VoIP subscriptions, but the FPSC staff relies on FCC data for Florida business VoIP subscriptions.[61] The FCC tracks this data and periodically reports it. However, the FCC's currently-published data only includes information through June 2021.

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[57]Marek, Sue, "Dish will expand VoNR throughout network later this year," Fierce Wireless, May 10, 2023, https://www.fiercewireless.com/5g/dish-will-expand-vonr-throughout-network-later-year, accessed June 21, 2023.

[58]Marek, Sue, Uscellualr CTO says FWA offering is 'wildly successful', Fierce Wireless, May 9, 2023, https://www.fiercewireless.com/wireless/uscellular-cto-says-fwa-offering-wildly-successful, accessed June 21, 2023.

[59]47 C.F.R. § 9.3.

[60]47 U.S.C. § 153(36). An example of a non-interconnected VoIP network is a video game console service such as Xbox Live.

[61]FiTV represents several of Florida's largest cable-based communications providers.

FCC data from June 2016 through June 2021 showed an annual growth rate for VoIP of one percent per year.[62] The FCC also reported that there were nearly 67 million Interconnected VoIP subscribers in the U.S.[63] Table 3-1 shows U.S. VoIP subscribership by customer type as of June 30, 2021. Data collected by the FPSC also shows nearly 2 million residential VoIP subscribers in Florida in 2022.[64]

Table 3-1
U.S. Interconnected VoIP Subscribership by Customer Type
(In Thousands)

Total	Over-the-Top	All Other VoIP	Total
ILEC	69	11,031	11,100
Non-ILEC	15,495	40,284	55,779
Total	15,564	51,314	66,878
Residential			
ILEC	0	6,644	6,644
Non-ILEC	1,873	24,100	25,973
Total	1,874	30,744	32,617
Business			
ILEC	69	4,387	4,456
Non-ILEC	13,621	16,545	32,617
Total	13,690	20,572	34,262

Source: FCC Voice Telephone Services Report, June 30, 2021 (Figure 3)

1. National Market

VoIP subscriptions have remained steady, both nationally and in Florida, while traditional switched access lines have decreased. As shown in Figure 3-3, the FCC reported approximately 66.9 million VoIP subscriptions and nearly 32.4 million switched access lines (TDM) as of June

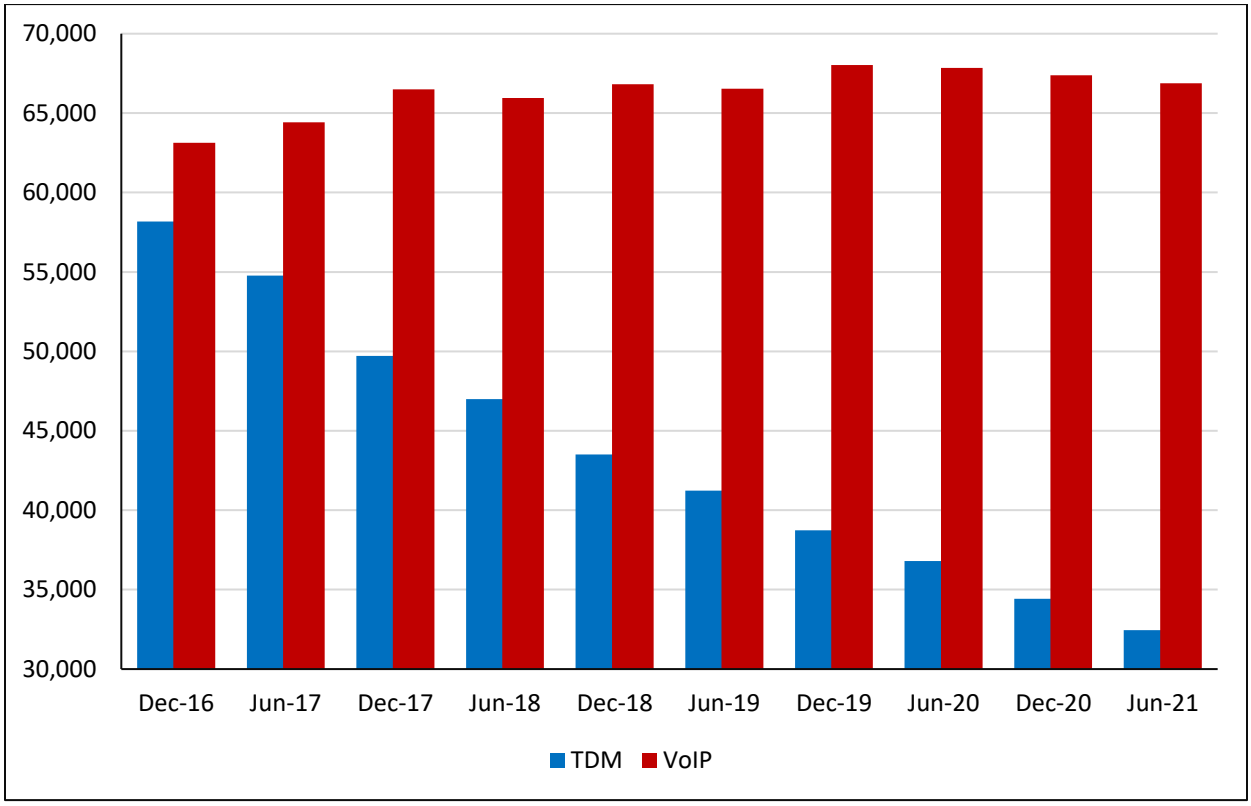
[62]FCC, "Voice Telephone Services: Status as of June 30, 2021," released August 1st, 2022, https://www.fcc.gov/voice-telephone-services-report, accessed June 21, 2023.

[63]Ibid, Figure 3, accessed April 20, 2023.

[64]Responses to FPSC competition data request 2022.

2021, resulting in approximately 99.3 million total voice telephone subscriptions.[65] Of those 99.3 million connections, 46.1 percent (45.8 million) were residential and 53.9 percent (53.5 million) were business.[66]

Figure 3-3
U.S. Retail Voice Telephone Subscriptions
(In Thousands)



Source: FCC Voice Telephone Services Report, June 2021

a. Facilities-Based VoIP Providers

According to the FCC, non-ILEC companies accounted for over 25.9 million residential VoIP subscribers as of June 2021, compared to nearly 6.6 million residential ILEC VoIP subscribers. This represents a market share of 80 percent for the non-ILECs in this market.[67] Comcast, the country's largest cable provider, reported a decrease just above ten percent from 2021 (8.6

[65]FCC, "Voice Telephone Services: Status as of June 30, 2021," released August 1, 2022, https://www.fcc.gov/voice-telephone-services-report, accessed June 21, 2023.

[66]Ibid.

[67]Responses to FPSC competition data request 2022.

million) to 2022 (7.7 million).[68] The second largest cable provider, Charter Communications, reported a total of approximately 7.9 million residential VoIP subscribers at year-end 2022, a decrease of just over 13 percent from 2021.[69] AT&T reported approximately 2.9 million U-verse VoIP subscribers at year-end 2022, which is nearly a 12 percent decrease from the previous year.[70]

Each of these top three facilities-based providers reported that improvements in wireless carriers' broadband infrastructure is a factor in consumer decisions to leave wireline broadband and VoIP services. These providers have developed wireless and video services and bundle them in an attempt to retain customers.

b. Over the Top VoIP Providers

Routing voice calls over a customer's existing internet connection allows over-the-top providers to have a much lower cost of service than wireline and wireless competition. According to the FCC, there were nearly 15.6 million OTT VoIP subscribers in the U.S. as of June 2021. This total included more than 1.9 million residential subscribers and just under 13.7 million business subscribers nationwide. The FCC's figures showed a decrease of approximately 18.5 percent in residential subscribers, and approximately 24.7 percent increase in business subscribers from June 2020 to June 2021.[71]

2. Florida Market

As previously stated, the FPSC does not have jurisdiction over VoIP services, which limits the agency's ability to determine an accurate estimate of the total number of VoIP subscribers in Florida. For the Florida VoIP residential market, several ILECs and CLECs in Florida voluntarily responded to the Commission's data request and provided information on the number of residential VoIP subscribers. FiTV reported roughly 700,000 million residential VoIP subscribers for the four member providers in 2022.[72] For the Florida VoIP business market, the FCC reported non-ILECs in Florida served approximately 2 million business interconnected VoIP subscribers by June 2021, an increase of just over 4.3 percent from the end of June 2020.[73]

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[68]Comcast Corporation, "Comcast 2022 Annual Report on Form 10-K," released February 03, 2022, https://www.cmcsa.com/financials/annual-reports, accessed June 21, 2023.

[69]Charter Communications, Inc., "Charter Investors: Results, SEC Filings & Tax Information," News Release, released January 27, 2023, https://ir.charter.com/financial-information/annual-reports, accessed June 21, 2023.

[70]AT&T Inc. "Form 10-K," February 16, 2022, https://otp.tools.investis.com/clients/us/atnt2/sec/sec-outline.aspx?FilingId=15576872&Cik=0000732717&PaperOnly=0&HasOriginal=1 accessed June 21, 2023.

[71]FCC, "Voice Telephone Services: Status as of June 30, 2021," Table 1, released August 1, 2022, https://www.fcc.gov/voice-telephone-services-report, accessed June 21, 2023.

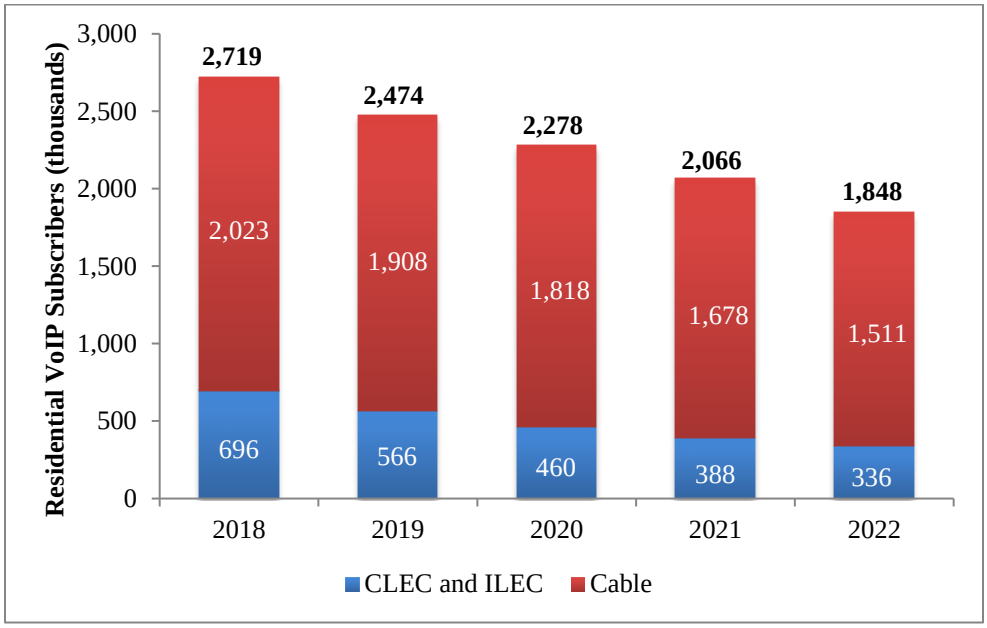
[72]Charter Communications is no longer a member of FiTV.

[73]FCC, "Voice Telephone Services Report, State-Level Subscriptions," Supplemental Table 1, Florida, released March 9, 2022, https://www.fcc.gov/voice-telephone-services-report, accessed June 21, 2023.

In total, the FCC reported that Florida had 4.6 million Interconnected VoIP subscriptions in June 2021.[74]

Figure 3-4 shows an estimated 1.8 million residential VoIP subscribers in Florida as of 2022. This data indicates a decrease of roughly 218,000 residential VoIP subscriptions from 2021. Over a five year time frame, the Florida residential VoIP market has declined about 8.4 percent per year. As previously stated, the major VoIP carriers have expressed that increased competition from wireless competitors has affected VoIP subscriptions.

Figure 3-4
Florida Residential Interconnected VoIP Subscribers

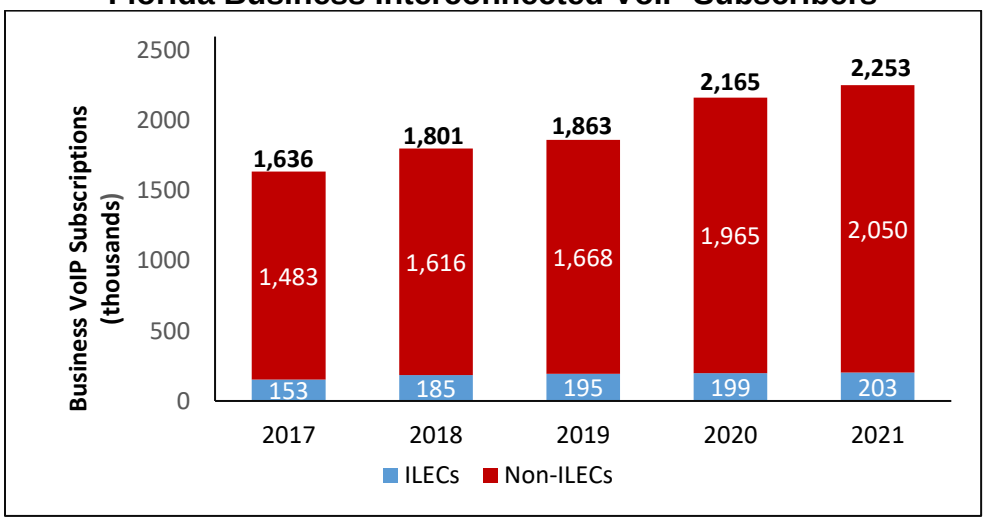


Source: Responses to local competition data request (2019-2023)

While Florida's residential VoIP market contracted over the past five years, its business VoIP market continued to expand, at least through 2021. Figure 3-5 displays VoIP business subscribers by ILEC and non-ILEC carriers as reported by the FCC. Business VoIP growth lagged behind residential growth for several years as cable companies concentrated on the residential market, but as that market matured, they turned their attention towards business customers.

[74]Ibid.

Figure 3-5
Florida Business Interconnected VoIP Subscribers



Source: FCC, Voice Telephone Services Report, June 2021, State Level Subscriptions

Chapter IV. Competitive Market Analysis & Statutory Issues

A. Statutory Issue – Competitive Providers

The ability of competitive providers to make functionally equivalent local exchange services available to both residential and business customers at competitive rates, terms, and conditions.

The data discussed in previous chapters suggests that competitive carriers are able to provide functionally equivalent services to residential and business customers at acceptable rates, terms, and conditions. As of June 16, 2023, 218 CLECs responded to the Local Competition Report data request. Several CLECs reported providing a number of services: local phone service (54), VoIP (92), broadband Internet access (68), video services (12), and bundled services (53).[75]

In response to FPSC data request questions, the majority of CLECs reported no barriers to competition or elected not to respond. However, the companies that did report competitive concerns mentioned issues with the difficulty in arranging and ordering physical trunk groups for direct connections with ILECs, as well as issues with ILEC online portal transition from Internet Explorer to Microsoft Edge.[76] We note that the CLECs have not filed any petitions with the Commission to address these issues. Some of these issues may be addressed by the FCC.

Conclusion: Dozens of competitors offered multiple combinations of services to attract customers. Also, subscriptions to wireline telephony decreased again in 2022, indicating consumer choice continues to be primarily wireless and VoIP services. Based on the multiple

[75]Responses to local competition data request 2023 as of May 12, 2023.

[76]Responses to local competition data request 2023.

services offered by alternative providers and their significant market share, companies are offering functionally equivalent services to both business and residential customers.

B. Statutory Issue – Consumers

The ability of consumers to obtain functionally equivalent services at comparable rates, terms, and conditions.

If companies are making functionally equivalent services available at comparable rates, terms, and conditions, as concluded in the previous issue, this issue determines whether or not there are significant impediments to consumers obtaining those services. One of the best determinants of whether consumers can obtain alternative services is the degree to which they are actually subscribing to them in large numbers.

Since reaching a peak in the year 2000, total traditional access lines have declined by over 92 percent in Florida, even as the population has grown significantly. Given the importance of telecommunications service and the large decline in traditional access lines, consumers must be finding service elsewhere. Competitors have been successfully maintaining substantial shares in traditional access lines as well as other technologies, such as wireless and VoIP.

Conclusion: The traditional wireline market continues to decrease despite population growth. Increasing demand for service is being met by wireless subscription growth and VoIP, and the majority of consumers are choosing to obtain wireless and VoIP service from competitors. Given competitors' substantial wireless and VoIP market shares, consumers are able to obtain functionally equivalent services at comparable rates, terms, and conditions.

C. Statutory Issue – Affordability & Reliability

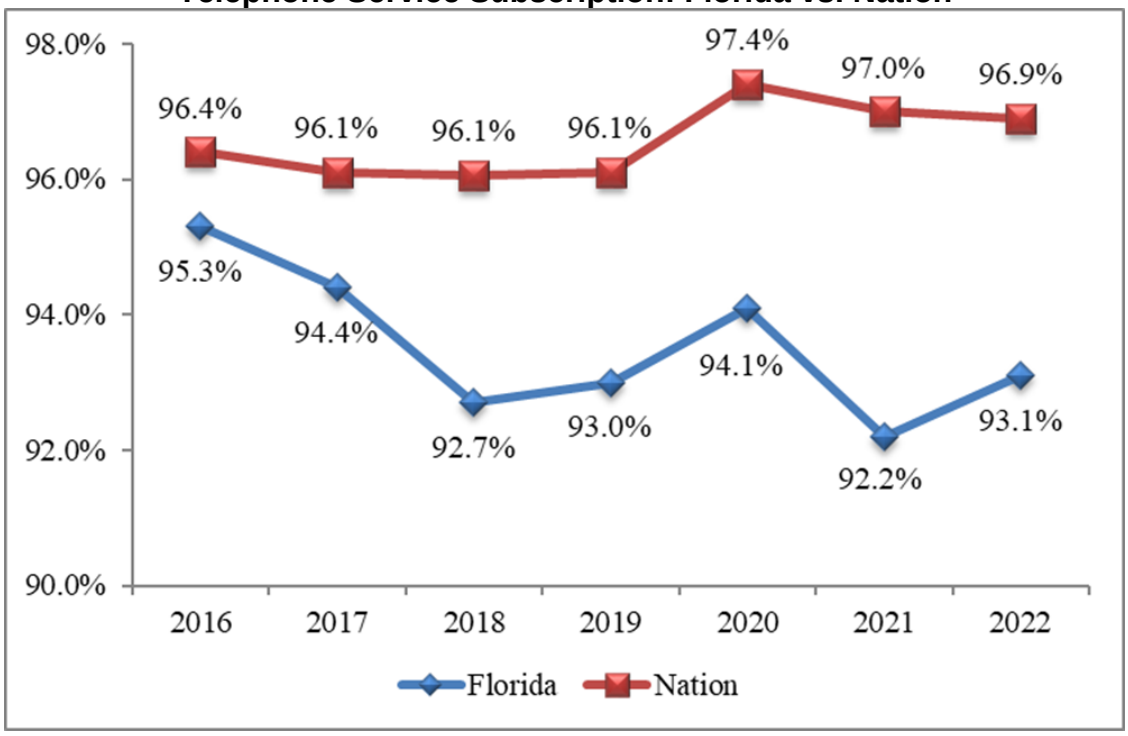
The overall impact of competition on the maintenance of reasonably affordable and reliable high-quality telecommunications services.

In order to successfully compete in a free market, a business needs to provide equivalent value to consumers. The value of telecommunications service is most broadly determined by affordability and reliability. As shown in Figure 4-1, the average Florida household telephone subscription rate has averaged 93.5 percent over the last seven years.[77] This high telephone subscription rate is not a recent occurrence; the average household telephone subscription rate has been 93.4 percent over the past 35 years.[78]

[77]FCC staff, interview, March 22, 2023.

[78]FCC staff, interviews (1986-2023).

Figure 4-1
Telephone Service Subscription: Florida vs. Nation



Source: FCC staff interviews

Following the passage of the Florida Regulatory Reform Act in 2011, the FPSC no longer retains jurisdiction over telecommunications consumer complaints and holds no data on quality of service.[79] However, consumers freely choosing competitors for telecommunications service suggests that they view competitors' services as having reliability that is sufficiently comparable to ILEC service.

Conclusion: A competitive market requires comparable affordability and reliability of service. The vast majority of Florida households subscribe to telephone service. Consumers are willing and able to choose telecommunications service from competitors using a variety of technologies. Based on competitors' substantial market share and market pressures requiring comparable affordability and reliability, competition is having a positive effect on the maintenance of reasonably affordable, reliable telecommunications services.

D. Statutory Issue – Carrier Disputes

A listing and short description of any carrier disputes filed under Section 364.16, F.S.

Conclusion: There were no carrier disputes filed with the FPSC under Section 364.16, F.S., in 2022.

[79]Regulatory Reform Act, Ch. 36, 2011 Fla. Laws 1231.

Chapter V. State Activities

This chapter provides a summary of state activities affecting local telecommunications competition in 2022. The state activities discussed in this chapter are important in helping to gauge how well the market is functioning for Florida businesses and consumers.

A. Intercarrier Matters

Wholesale performance measurement plans provide a standard against which the Commission can monitor performance over time to detect and correct any degradation in the quality of service ILECs provide to CLECs. The Commission adopted performance measurements for AT&T in August 2001 (revised in 2010), for CenturyLink in January 2003 (revised in 2013 and 2016), and for Verizon in June 2003 (revised in 2007 and later adopted by Frontier). Trending analysis is applied to monthly performance measurement data provided by each ILEC.[80]

AT&T is the only ILEC that is required to make payments to CLECs when certain performance measures do not comply with established standards and benchmarks. AT&T's current Performance Assessment Plan consists of 47 measurements; financial remedies are applied to 24 of these measures. On September 28, 2022, AT&T declared a force majeure event for Provisioning, Maintenance & Repair, and Trunk Group Performance measures in some of its wire centers as a result of Hurricane Ian. The declaration was lifted for the last affected wire centers on October 10, 2022. AT&T paid $147,573 in remedies in 2022, representing an increase of 29.2 percent from 2021.[81]

On October 15, 2015, CenturyLink filed proposed revisions to its Performance Measurement Plan as a result of a negotiated settlement with the Nevada Public Utilities Commission. The revisions included revising reporting requirements from monthly to quarterly, eliminating several performance measures from the plan, and amending two measures. The proposal was approved for Florida by the Commission on February 15, 2016.[82] CenturyLink has reported no noncompliance since the revisions were adopted. Following its approval by the Nevada Public Utilities Commission, on April 26, 2023, CenturyLink filed a request for forbearance from following its Performance Measurement Plan in Florida, citing changes in the telecommunications market.[83] The FPSC is scheduled to consider this request later this year.

[80]FPSC Dockets: Nos. 20000121A-TP (AT&T), 20000121B-TP (CenturyLink), and 20000121C-TP (Frontier FL).

[81]Remedies are paid two months in arrears; amounts shown are for payments made in 2021 and 2022.

[82]FPSC Order No. PSC-2016-0072-PAA-TP, Docket No. 20000121B-TP, Investigation into the establishment of operations support systems permanent performance measures for incumbent local exchange telecommunications companies (CenturyLink Florida Track), issued February 15, 2016, http://www.psc.state.fl.us/library/filings/2016/00858-2016/00858-2016.pdf , accessed June 21, 2023.

[83]FPSC Document No. 02887-2023, Docket No. 20000121B-TP, Investigation into the establishment of operations support systems permanent performance measures for incumbent local exchange telecommunications companies (CenturyLink Florida Track), filed April 26, 2023, https://www.floridapsc.com/pscfiles/library/filings/2023/02887-2023/02887-2023.pdf, accessed June 21, 2023.

Frontier Communications completed its purchase of Verizon Florida's wireline operations in April 2016. In its role as a major ILEC, Frontier is responsible for a Performance Measurement Plan that includes 29 measures. In 2022, Frontier maintained an average monthly compliance rate of 80.6 percent, yielding a 3.6 percent decrease from 2021's average monthly compliance rate of 84.2 percent.

The Commission processed a number of other telecommunications-related items in 2022. The Commission processed 54 service schedule and tariff filings, 70 interconnection agreements and amendments, 12 carrier certifications, 9 certificate cancellations, and 28 general inquiries/informal complaints.

B. Numbering Resources

Numbering resources are administered by the North American Numbering Plan Administrator (NANPA). NANPA's responsibilities include assigning area codes and prefixes, and tracking numbering usage to ensure effective and efficient utilization. Also, NANPA is responsible for forecasting the exhaust of geographic area codes and area code relief planning. While NANPA is responsible for forecasting the exhaust of area codes, the FPSC is responsible for determining the appropriate form of area code relief when telephone numbers exhaust within a Numbering Plan Area (NPA).

Several methods are available to handle area code exhaust issues, however an overlay has been the preferred method. An overlay adds a new area code to the same geographic area served by the area code requiring relief. This results in assigning more than one area code to the same NPA. Current customers keep their existing area code and number; however, new customers or customers adding additional lines receive the new area code. Once an overlay is implemented, the FCC requires 10-digit dialing for all local calls within the NPA.

In 2022, the Commission approved two overlay relief plans. The first approved overlay was for the 305/786 area code, which serves Miami-Dade County and the Florida Keys.[84] The new area code, 645, will be implemented in the third quarter of 2023. The second approved overlay was for the 904 area code, which serves all or most of Nassau, Duval, Baker, Bradford, Clay, St Johns, and Union Counties.[85] The new area code, 324, will be implemented in 2024.

[84]FPSC Order No. PSC-2022-0050-PAA-TP, Docket No. 20210190-TP, Petition on behalf of the Florida telecommunications industry for expeditious approval of the industry's consensus recommendation to implement Alternative No. 1, the all-services distributed overlay of the 305/786 NPA overlay, by North American Numbering Plan Administrator. issued February 2, 2022, https://www.floridapsc.com/pscfiles/library/filings/2022/00988-2022/00988-2022.pdf, accessed June 21, 2023.

[85]FPSC Order No. PSC-2022-0178-PAA-TP, Docket No. 20220036-TP, Petition of North American Numbering Plan Administrator on behalf of the Florida telecommunications industry, in the matter of the implementation for relief of the 904 numbering plan area., issued May 10, 2022, https://www.floridapsc.com/pscfiles/library/filings/2022/02883-2022/02883-2022.pdf, accessed June 21, 2023.

C. Lifeline

The Lifeline program is designed to enable low-income households to obtain and maintain basic telephone and broadband services by offering qualifying households a discount on their monthly bills. The FPSC has oversight over the Lifeline program in Florida pursuant to Section 364.10, F.S. However, the Lifeline program is a federal Universal Service Fund (USF) program. The rules affecting the Lifeline program are established by the FCC, which has designated the Universal Service Administrative Company (USAC), an independent not-for-profit corporation, as the program's administrator. USAC is responsible for data collection and maintenance, support calculation, and disbursement for the Lifeline program along with other federal USF programs.

Customers apply for Lifeline through the National Verifier, which is a electronic system established by the FCC to determine customer eligibility. Customers can complete their application online through the National Verifier portal and eligible telecommunications companies (ETCs) can assist customers applying by utilizing an interconnected provider portal.[86] Upon completion of an application, and subsequent approval for the Lifeline program, customers are able to find a Lifeline service provider through USAC's "Companies Near Me" tool.[87]

The FPSC has a Lifeline promotion process to encourage participation in the Lifeline program. This process involves a computer interface between the FPSC and the Florida Department of Children and Families identifying clients who are eligible for Lifeline due to their approval for the Medicaid and SNAP programs. ETCs access this system and contact their customers to determine if they have already been approved for the Lifeline program through the National Verifier. For those customers who have not yet applied for the program, ETCs will either instruct customers on how to apply or assist these customers with their applications in person. If a customer mistakenly identifies an ETC that does not serve the area in which they live, the FPSC sends instructions on how to apply with the National Verifier, along with a list of each ETC's contact information.

Using SNAP participation as a proxy for Lifeline eligible households, as of June 2022, eligible households decreased by 15.54 percent, while enrollment of those households in the Lifeline program increased by 9.7 percent from the prior year.[88] Overall, the Lifeline participation rate was 18.88 percent in 2022, a slight increase from the prior year. Table 5-1 shows the Lifeline eligibility and participation rates in Florida for the last six years.[89]

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[86]USAC, "National Verifier Application Portal," https://nationalverifier.servicenowservices.com/lifeline, accessed June 21, 2023.

[87]USAC, "Companies Near Me Tool," https://data.usac.org/publicreports/CompaniesNearMe/Download/Report, accessed June 21, 2023.

[88]FPSC, "2022 Florida Lifeline Report," released December 2022, https://www.floridapsc.com/pscfiles/website-files/PDF/Publications/Reports/Telecommunication/LifelineReport/2022.pdf, Figure 3, accessed June 21, 2023.

[89]Ibid.

Table 5-1
Florida Lifeline Eligibility and Participation Rate

Year	Lifeline Enrollment	Eligible Households	Participation Rate
Jun-17	685,864	1,690,899	40.56%
Jun-18	694,647	1,655,134	41.97%
Jun-19	604,693	1,540,682	39.25%
Jun-20	371,180	2,151,503	17.25%
Jun-21	273,641	1,882,842	14.53%
Jun-22	300,285	1,590,216	18.88%

Source: Florida DCF, ACCESS Florida: Standard Data Reports

D. Telecommunications Relay Service

Telecommunications Relay Service (TRS) facilitates telephone calls between people with hearing loss or speech disabilities and other individuals by using special equipment and a communications assistance operator to relay information. Section 427.704, F.S., charges the Commission with overseeing the administration of a statewide telecommunications access system which provides TRS. Funding for TRS in Florida is through a surcharge on switched access lines. The current assessment rate is $0.10 per line per month [*Note: This rate may change based on 7/11/23 Agenda decision*].[90] Relay services are currently provisioned under contract by T-Mobile USA, Inc.

Chapter VI. Federal Activities

A. Mergers and Acquisitions

Telecommunications carriers seeking to transfer assets or corporate control in mergers and acquisitions must first receive approval from the FCC, which examines the public interest impact of proposed mergers or acquisitions. In 2022, there were approximately 49 completed telecommunications mergers and acquisitions nationally. Recent transactions of interest to Florida are described below.

1. CenturyLink/Lumen Technologies & Apollo

On August 3, 2021, Lumen announced it was selling twenty of its 36 U.S.-based, CenturyLink-branded ILEC service territories to Apollo Global Management for a total of $7.5 billion. The divestiture included fiber, copper networks, tower site connections and central offices. On June

[90]The rate may not exceed $.25 per landline.

14th, 2022, the FCC approved the transaction. The Florida ILEC was not among the territories sold and will remain a CenturyLink-branded Lumen subsidiary.[91]

2. BullsEye & Lingo Entities

On June 14, 2022, The FCC approved an application filed for the transfer of control of BullsEye Telecom, Inc. to Lingo Management, LLC, Lingo Communications, LLC and B. Riley Principal Investments, LLC. BullsEye, a Michigan corporation, provides telecommunications services in the District of Columbia and the lower 48 states, including Florida. Lingo Management, LLC, a Delaware limited liability and holding company, provides telecommunication services in multiple states through its operating subsidiaries. After the proposed transaction, indirect ownership and control of BullsEye will be transferred to the Lingo entities (20%) and B. Riley Principal Investments, LLC (80%). The FCC chose not to streamline the request due to the complexity of the transaction.[92]

B. Broadband Deployment

The federal government has recognized there is no one-size-fits-all solution to delivering broadband service to rural areas. The 2021 Infrastructure Investment and Jobs Act (IIJA) allocates $65 billion in broadband infrastructure investment, creating multiple programs that envision using many technologies including fiber, fixed wireless, and satellites.[93]

Multiple federal agencies are responsible for broadband deployment and affordability programs through existing mechanisms as well as the IIJA. The FCC is in charge of several programs, including the Rural Digital Opportunity Fund (RDOF), which will provide $20.4 billion in support to providers nationally over ten years for unserved and underserved areas. The FCC ultimately awarded RDOF support of over $152 million to 7 providers over ten years to provide service in Florida. More details about the status of that support may be found in the High Cost discussion under the Universal Service section of this chapter.[94]

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[91]Lumen Technologies, Inc., "Form 10-K for the fiscal year ended December 31, 2021," February 24, 2022, https://d18rn0p25nwr6d.cloudfront.net/CIK-0000018926/12795305-7ff0-4e6a-ba1f-e0f9335f51d8.pdf, accessed June 21, 2023.

[92]FCC, Domestic Section 214 Application Filed For The Transfer Of Control Of BullsEye Telecom, Inc. to the Lingo Entities, May 10, 2022, https://docs.fcc.gov/public/attachments/DA-22-512A1.pdf, accessed June 21, 2023.

[93]117th Congress (2021-2022), "H.R.3684 - Infrastructure Investment and Jobs Act," November 15, 2021, https://www.congress.gov/bill/117th-congress/house-bill/3684, accessed June 21, 2023.

[94]FCC, Auction 904: Rural Digital Opportunity Fund, January 13, 2023, https://www.fcc.gov/auction/904, accessed June 21, 2023.

The FCC's Affordable Connectivity Program (ACP) was created from the Emergency Broadband Benefit Program with an allocation of $14.2 billion from the IIJA. The ACP provides a discount of up to $30 per month toward internet service for eligible households and up to $75 per month for households on qualifying Tribal lands. It also provides a one-time discount of up to $100 to purchase a laptop, desktop computer, or tablet from participating providers.[95,96] As of April 17, 2023, 1,230,298 households in Florida were enrolled in the ACP through 125 providers offering mobile and/or fixed broadband access.[97,98] The FCC also established two programs to promote ACP participation: the Affordable Connectivity Outreach Grant Program and the "Your Home, Your Internet" pilot program.[99,100] ACP promotion grants awarded in Florida include:

The National Competitive Outreach Program

- Blueprint2000Beyond, Tallahassee FL: $214,355
- Community Health of South Florida, Inc., Miami FL: $450,000
- Goodwill Industries of Southwest Florida, Inc., Fort Myers FL: $200,000[101]

The "Your Home, Your Internet" pilot program awarded the Housing Authority of the City of Tampa Florida a grant of $152,413,[102] The FCC has also implemented COVID-19 related programs such as the Connected Care Pilot Program, COVID-19 Telehealth Program, and the Emergency Connectivity Fund.

NTIA has been charged by the IIJA with administering nearly a dozen different broadband deployment programs. These programs will invest over $47 billion in broadband

[95]FCC, "FCC Launches Affordable Connectivity Program," December 31, 2021, https://www.fcc.gov/document/fcc-launches-affordable-connectivity-program, accessed June 21, 2023.

[96]FCC, "FCC Adopts Rules To Implement Affordable Connectivity Program," January 14, 2022, https://www.fcc.gov/document/fcc-adopts-rules-implement-affordable-connectivity-program, accessed June 21, 2023.

[97]FCC, Affordable Connectivity Program Providers, May 17, 2023, https://www.fcc.gov/affordable-connectivity-program-providers, accessed June 21, 2023.

[98]USAC, ACP Enrollment and Claims Tracker, April 17, 2023, https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/, accessed June 21, 2023.

[99]FCC, "FCC Establishes Affordable Connectivity Outreach Grant Program," August 8, 2022, https://www.fcc.gov/document/fcc-establishes-affordable-connectivity-outreach-grant-program-0, accessed June 21, 2023.

[100]FCC, "FCC Creates 'Your Home, Your Internet' Pilot Program," August 8, 2022, https://www.fcc.gov/document/fcc-creates-your-home-your-internet-pilot-program-0, accessed June 21, 2023.

[101]FCC, "FCC Announces $66M in Affordable Broadband Outreach Grants," March 10, 2022, https://www.fcc.gov/document/fcc-announces-66m-affordable-broadband-outreach-grants-0, accessed June 21, 2023.

[102]FCC, "FCC Targets Over $7M Toward Affordable Connectivity Program Awareness," March 15, 2022, https://www.fcc.gov/document/fcc-targets-over-7m-toward-affordable-connectivity-program-awareness-0, accessed June 21, 2023.

infrastructure.[103,104,105] On May 13, 2022, the NTIA announced the launch of the Biden Administration's Internet for All initiative, which will help organize the investment of $45 billion of the broadband support.[106] On November 29, 2022, NTIA announced that Florida received an "Internet for All" grant of $7.4 million in funding, which is comprised of $5 million in Broadband Equity, Access and Deployment Program Support for planning, infrastructure deployment and adoption programs and $2.4 million for the Digital Equity Act planning efforts.[107]

Another NTIA program is the Connecting Minority Communities Pilot Program. It specifically directed $268 million from the Consolidated Appropriations Act of 2021 to expanding high-speed Internet access and connectivity to eligible Historically Black Colleges and Universities, Tribal Colleges or Universities, and other Minority-serving institutions.[108] In Florida, NTIA awarded $10.8 million to three educational institutions in 2023, including:

- Broward College $3 million
- Florida A&M University $5.4 million
- Miami Dade College $2.4 million[109,110]

The Rural Utilities Service of the United States Department of Agriculture maintains several programs for broadband deployment. The Consolidated Appropriations Act, 2023 includes $364

[103]NTIA, "Commerce Department's NTIA Announces $288 Million in Funding Available to States to Build Broadband Infrastructure," May 19, 2021, https://www.ntia.doc.gov/press-release/2021/commerce-department-s-ntia-announces-288-million-funding-available-states-build, accessed June 21, 2023.

[104]NTIA, Connecting Minority Communities Pilot Program, December 2, 2021, https://www.ntia.doc.gov/press-release/2021/commerce-department-s-ntia-announces-288-million-funding-available-states-build, accessed June 21, 2023.

[105]NTIA, "NTIA's Role in Implementing the Broadband Provisions of the 2021 Infrastructure Investment and Jobs Act," November 16, 2021, https://broadbandusa.ntia.doc.gov/news/latest-news/ntias-role-implementing-broadband-provisions-2021-infrastructure-investment-and, accessed June 21, 2023.

[106]NTIA, "Biden-Harris Administration Launches $45 Billion "Internet for All" Initiative to Bring Affordable, Reliable High-Speed Internet to Everyone in America," May 13, 2022, https://www.ntia.doc.gov/press-release/2022/biden-harris-administration-launches-45-billion-internet-all-initiative-bring, accessed June 21 2023.

[107]NTIA, "Biden-Harris Administration Awards More Than $7.4 Million to Florida in 'Internet for All' Planning Grants," November 29, 2022, https://www.ntia.doc.gov/press-release/2022/biden-harris-administration-awards-more-74-million-florida-internet-all-planning, accessed June 21, 2023.

[108]BroadbandUSA, Connecting Minority Communities Program, https://broadbandusa.ntia.doc.gov/funding-programs/connecting-minority-communities, accessed June 21, 2023.

[109]NTIA, "Biden-Harris Administration Announces More Than $33.5 Million in Internet for All Grants to 12 Minority-Serving Colleges and Universities," January 30, 2023, https://broadbandusa.ntia.doc.gov/news/latest-news/biden-harris-administration-announces-more-335-million-internet-all-grants-12, accessed June 21, 2023.

[110]NTIA, "Biden-Harris Administration Announces More Than $175 Million in Internet for All Grants to 61 Minority-Serving Colleges and Universities," February 22, 2023, https://broadbandusa.ntia.doc.gov/news/latest-news/biden-harris-administration-announces-more-175-million-internet-all-grants-61, accessed June 21, 2023.

million for the ReConnect Program, $65 million for the Distance Learning, Telemedicine, and Broadband Program, $35 million for the Community Connect Grant Program, and $690 million for direct, Treasury-rate, telecommunications loan authorizations.[111]

The United States Department of Housing and Urban Development awards support from its Community Development Block Grant - CV (CDBG-CV) program to primarily benefits low- and moderate-income residents for various activities including broadband infrastructure and planning. In Florida, the CDBG-CV program is administered by the Florida Department of Economic Opportunity. On August 22, 2022, Governor Ron DeSantis awarded more than $22 million for community development projects in ten Florida communities, including nearly $3 million for addressing historical broadband deficiencies in Micanopy, Florida.[112]

Given the plethora of federal broadband programs, NTIA maintains a Federal Funding site, which serves as a comprehensive, "one-stop shop" of resources for potential applicants seeking federal broadband funding. The site includes broadband funding opportunities and information on more than 80 federal programs across 14 federal agencies.[113]

C. Universal Service

Universal service is the policy that seeks to ensure all Americans have access to communications services through a series of financial support programs. The USF supports the budgets of universal service programs. The USF is funded by telecommunications providers based on an assessment of interstate and international revenues. Carriers are allowed by federal rules to pass these costs on to their customers through their bills.

In general, Florida consumers pay more into the USF than what is returned to eligible service providers in Florida.[114] For 2021, only consumers in California were larger net contributors than consumers in Florida. The FCC annually publishes contributions to and disbursements from the fund. The most current data for this report is through December 2021. Table 6-1 shows Florida's estimated contribution and receipts for 2021 and provides a comparison of net contributions for 2019 and 2020. The total estimated consumer contribution for 2021 includes approximately $14 million related to USAC's administrative expense.

[111]Congress.gov, "H.R.2617 - Consolidated Appropriations Act, 2023," https://www.congress.gov/bill/117th-congress/house-bill/2617, accessed June 21, 2023.

[112]DEO, "Governor Ron DeSantis Awards More Than $22 Million for Community Development Projects in 10 Florida Communities," August 22, 2022, https://www.floridajobs.org/news-center/DEO-Press/2022/08/22/governor-ron-desantis-awards-more-than-$22-million-for-community-development-projects-in-10-florida-communities, accessed June 21, 2023.

[113]BroadbandUSA, NTIA Launches Updated Federal Broadband Funding Guide, https://broadbandusa. ntia.doc.gov/news/latest-news/ntia-launches-updated-federal-broadband-funding-guide-0, accessed June 21, 2023.

[114]FCC, Universal Service Monitoring Report-2022, released February 13, 2023, https://docs.fcc.gov/public/attachments/DOC-391070A1.pdf, accessed June 21, 2023.

Table 6-1
Federal Universal Service Payments and Contributions in Florida
(Thousands of Dollars)

	2019	2020	2021		
	Estimated Net	Estimated Net	Service Providers Payments	Estimated Contributions	Estimated Net
High-Cost	(249,610)	(248,298)	39,811	290,610	(250,799)
Low Income	2,486	(8,978)	28,705	41,014	(12,309)
Schools & Libraries	(37,729)	(31,925)	80,959	121,613	(40,654)
Rural Health Care	(9,705)	(12,255)	7,195	31,541	(24,346)
Admin. Expense	(11,233)	(11,648)		14,276	(14,276)
Total	($305,791)	(313,104)	156,670	499,054	(342,384)

Source: FCC Universal Service Monitoring Report, various years, Table 1.9

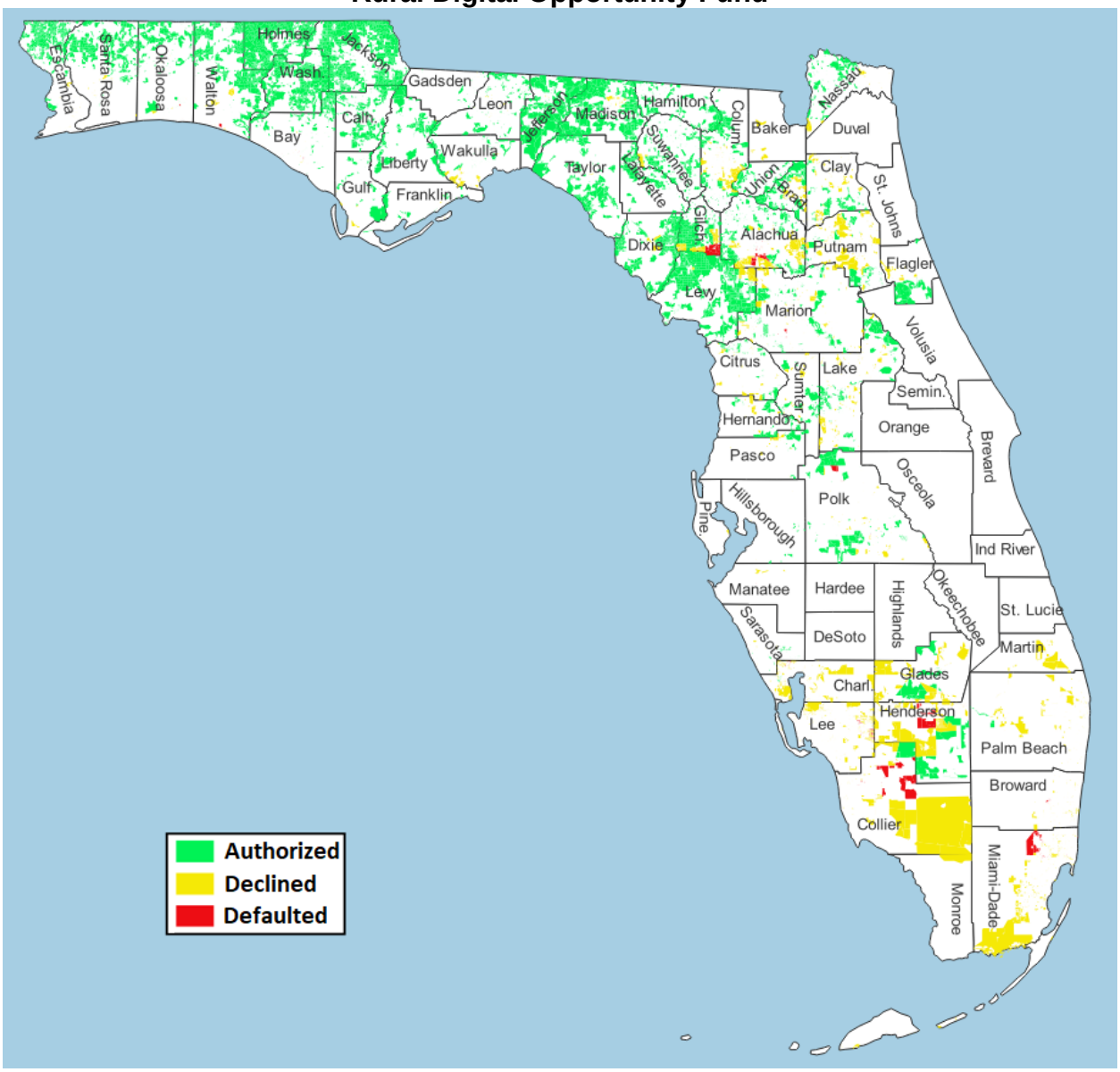
1. High Cost

Since 2011, the FCC has been modernizing the federal high-cost programs to maintain voice services and extend broadband capable infrastructure.[115] On January 30, 2020, the FCC adopted a Report and Order establishing the framework for the $20.4 billion RDOF to bring high speed fixed broadband service to rural homes and small businesses, using reverse auctions in two phases.

The Phase I auction targeted over six million homes and businesses in census blocks that are entirely unserved by voice and broadband with download speeds of at least 25 Mbps. The RDOF is structured to prioritize higher network speeds and lower latency. Figure 6-1 provides a map identifying areas in Florida that will receive RDOF support in the first phase of the program.

[115]FCC 11-161, WC Docket No. 10-90, Report and Order and Further Notice of Proposed Rulemaking, released November 18, 2011, https://docs.fcc.gov/public/attachments/FCC-11-161A1.pdf, accessed June 21, 2023.

Figure 6-1
Areas in Florida Eligible for Phase I
Rural Digital Opportunity Fund



Source: FCC, US Census Bureau Shapefile

Seven providers in Florida were authorized by the FCC to receive RDOF support of over $152.1 million over ten years.[116] Starlink was originally on track to receive $33.6 million in funding in Florida to cover 34,757 census blocks, however, the FCC declined Starlink's final application.

[116]Designated by the FCC as "authorized" include: Bright House Network Information Services, Conexon Connect LLC, Consolidated Communications of Florida Company, Embarq Florida, Inc, Frontier Florida LLC, Mediacom Wireless of Florida LLC, and Windstream Florida LLC.

The FCC determined that the application failed to demonstrate that Starlink could deliver the promised service. As a result, broadband funding will not be available in those census blocks.[117] Defaulted areas represent areas where the carrier that was initially awarded RDOF support failed to file the final application with the FCC. Both the defaulted and declined areas will not receive RDOF funding in the first phase of the program. However in the second RDOF phase, the remaining program funds along with an additional $4.4 billion will be used to cover unserved locations not previously funded.[118] Locations in census blocks that are partially served will also be eligible to receive support in the second phase.

Two companies that defaulted from the RDOF in Florida were penalized for their violation of federal rules by the FCC. AB Indiana committed two rule violations resulting in a forfeiture of $53,000.[119] Similarly, Hotwire defaulted on 32 census blocks, with the FCC concluding that 28 of those defaults were individual rule violations that resulted in a forfeiture of $84,000 against Hotwire.[120]

2. Schools and Libraries

The schools and libraries support program, commonly known as the E-Rate Program, provides financial support to eligible schools and libraries for connectivity. The discounts range from 20 percent to 90 percent of the costs of eligible services, depending on the level of poverty and whether the school or library is located in an urban or rural area. The E-Rate program has two funding categories that support schools and libraries. Category One provides connectivity to schools and libraries (e.g. access lines, broadband connections, etc.) and Category Two provides connectivity for services within schools and libraries (e.g. routers, servers, etc.). The E-Rate program has a funding cap that is annually adjusted for inflation. For 2023, this represents a 7 percent increase, establishing a new cap of $4.77 billion.[121] Figure 6-2 illustrates a comparison of the amounts disbursed in Florida for funding years 2017-2021 (the latest data years available).

[117]FCC, News Release, released August 10, 2022, https://www.fcc.gov/document/fcc-rejects-ltd-broadband-starlink-bids-broadband-subsidies, accessed June 21, 2023.

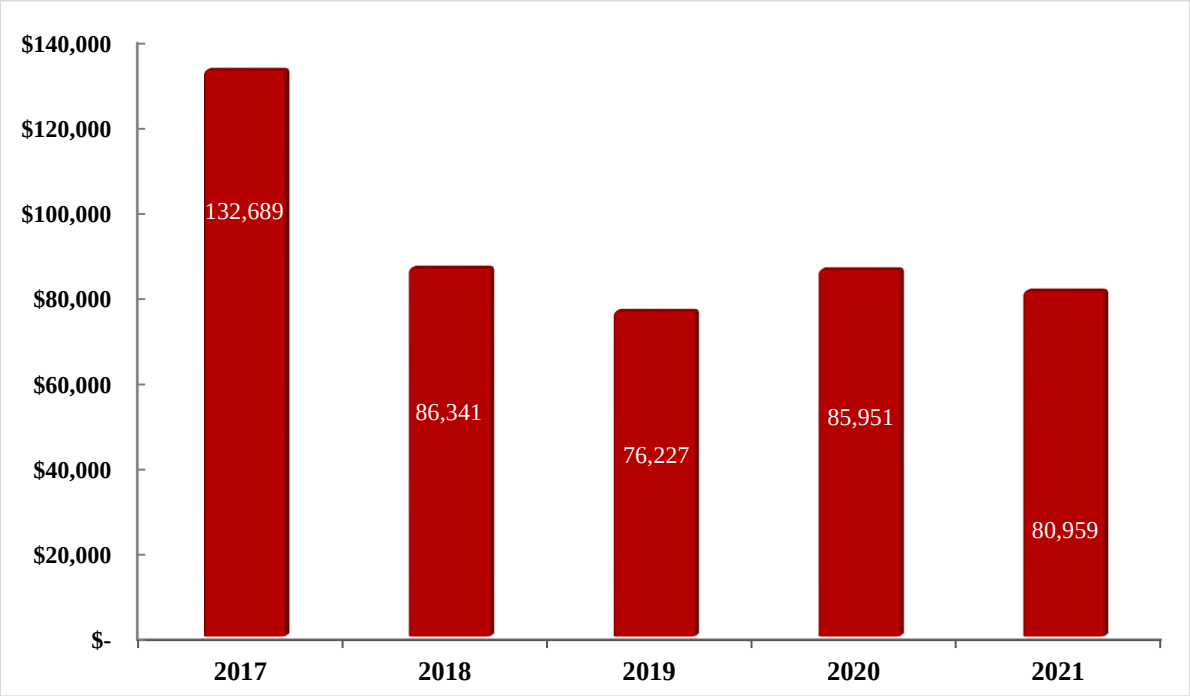
[118]FCC 19-77, WC Docket No 19-126, Notice of Proposed Rulemaking, released August 2, 2019 https://docs.fcc.gov/public/attachments/FCC-19-77A1.pdf, accessed June 21, 2023.

[119]FCC 23-33, Notice of Apparent Liability for Forfeiture, released May 1, 2023, https://docs.fcc.gov/public/attachments/FCC-23-33A1.pdf, accessed June 21, 2023.

[120]FCC 22-59, Notice of Apparent Liability for Forfeiture, released July 22, 2022, https://docs.fcc.gov/public/attachments/FCC-22-59A1.pdf, accessed June 21, 2023.

[121]FCC DA 23-178, Public Notice, released March 3, 2023, https://docs.fcc.gov/public/attachments/DA-23-178A1.pdf, accessed June 21 2023.

Figure 6-2
School and Libraries Funding Disbursements in Florida
(In Thousands)



Source: Universal Service Monitoring Report, Table 1.9

3. Low Income

The Lifeline program provides a monthly discount on phone or broadband service for qualifying low-income consumers. In 2016, the FCC reformed the Lifeline program to transition to a more broadband-focused program, which included a phase-down of federal support for voice-only services.[122] Broadband services that include a voice component will continue to be eligible to receive Lifeline support after the final phase-out date of December 1, 2023. As discussed in Chapter V above, 300,285 Floridians participated in the Lifeline program as of June 2022.

4. Rural Health Care

The goal of the Rural Health Care (RHC) Program is to ensure the affordability of telehealth services in rural communities to promote healthcare in underserved and hard to reach geographic areas. To achieve these goals, the RHC Program provides funding to eligible rural healthcare providers for broadband and telecommunications services. The new RHC funding cap for 2023 was established by the FCC at $682 million.[123] This represents a 7 percent increase from the

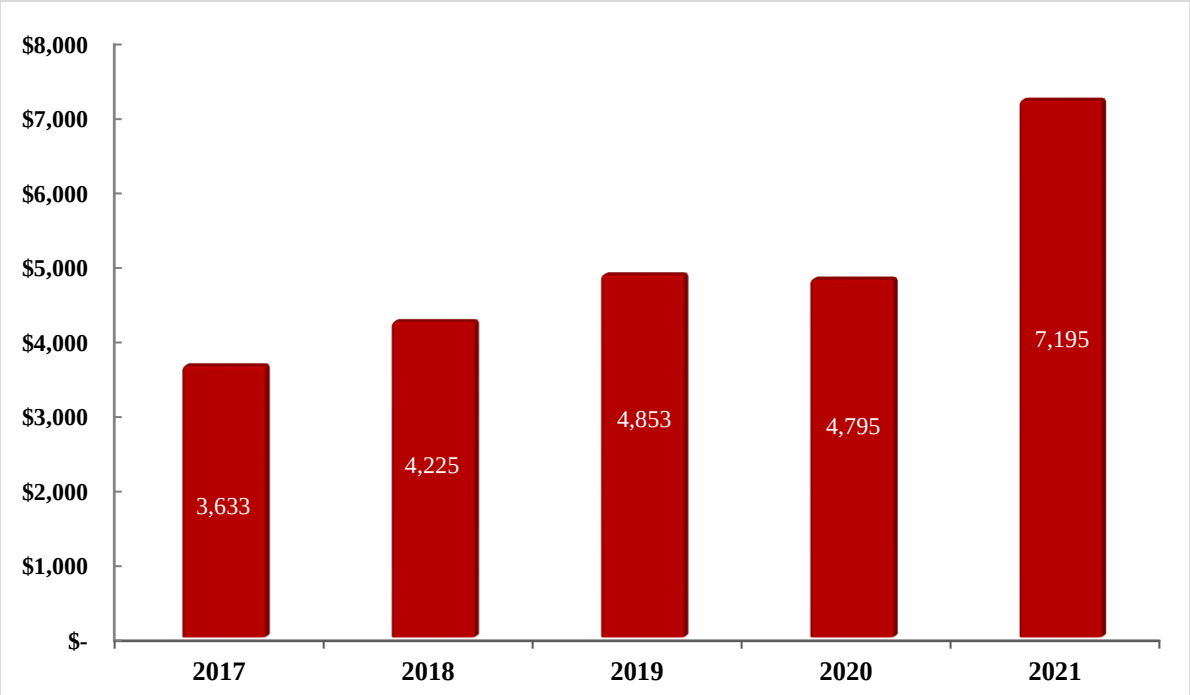
[122]FCC 16-38, WC Docket No. 11-42, Third Report and Order, Further Report and Order, and Order on Reconsideration, released April 27, 2016, https://docs.fcc.gov/public/attachments/FCC-16-38A1.pdf, accessed June 21, 2023.

[123]FCC DA 23-178, Public Notice, released March 3, 2023, https://docs.fcc.gov/public/attachments/DA-23-178A1.pdf, accessed June 21, 2023.

prior year's cap to adjust for inflation. Funding is distributed through two programs: the Telecommunications Program and the Healthcare Connect Fund Program.

The Telecommunications Program subsidizes the difference between urban and rural rates for telecommunications services. By comparison, the Healthcare Connect Fund Program promotes the use of broadband services by providing a flat 65% discount on an array of communications services to both individual rural healthcare providers and any related healthcare consortia.[124] In 2021, all RHC funds in Florida were from the Health Care Connect Fund program. Figure 6-3 illustrates a comparison of the amounts disbursed in Florida for funding years 2017-2021 (the latest data years available).

Figure 6-3
Rural Health Care Funding Disbursements in Florida
(In Thousands)



Source: Universal Service Monitoring Report, Table 1.9

[124]FCC, "Universal Service Monitoring Report - 2022," https://docs.fcc.gov/public/attachments/DOC-391070A1.pdf, accessed June 21, 2023.

D. Public Safety

Florida has faced numerous public safety challenges in the use of its telecom networks.

1. Emergency Response

On September 23, 2022, Hurricane Ian, a Category 5 hurricane, made landfall in southwest Florida on Cayo Costa Island. Along with other infrastructure, the telecommunications network sustained major damage. The initial FCC communications status report included 63 Florida counties. At the peak level of damage, nearly 64 percent of cell sites in the most affected counties (Charlotte, Desoto, and Lee) were rendered nonfunctional, while the peak of cable and wireline service outages exceeded 800,000 subscribers. Other outages included: 15 FM radio stations, six AM stations, and four Public Safety Answering Points.[125]

In preparation and response, the FCC took several steps to promote public safety and connectivity. These steps included updating status and restoration efforts with status reports and granting waivers of its Affordable Connectivity Program non-usage requirement and de-enrollment for non-usage rules and Lifeline program non-usage, recertification, and reverification requirements. The FCC also extended deadlines for the COVID-19 Telehealth, E-Rate, and Rural Health Care Programs.[126] In addition to service restoration efforts, providers responded with several steps including: opening up free Wi-Fi hotspots, waiving overage and late charges, and allowing unlimited talk, text, and data.

On November 11, 2022, Hurricane Nicole, a Category 1 hurricane, made landfall in central Florida near Vero Beach. Along with other infrastructure, the telecommunications network sustained damage. According to the FCC, at the peak level of damage in the affected Florida counties, nearly 0.9 percent of cell sites were rendered nonfunctional, while more than 175,000 cable and wireline subscribers experienced service outages. Other outages included: two FM radio stations and one AM stations.[127] In addition to tracking outages, the FCC issued several waivers of spectrum rules and extended filing and regulatory deadlines in affected areas.[128]

On November 17, 2022, after soliciting comments, the FCC held a hearing on the impact of Hurricanes Fiona and Ian on communications and the recovery effort. The hearing featured two panels, which explored lessons learned from the hurricanes, focusing largely on coordination between the communications and power sectors in response to these storms and on FCC actions to promote the availability of critical communications services following disasters. The first panel examined first-hand accounts from public safety stakeholders responding to disasters with the goal of exploring which measures are effective, which are not, and what lessons can be

[125]FCC, Hurricane Ian: Communications Status Reports, released September 28 - October 10, 2022, https://www.fcc.gov/ian, accessed June 21, 2023.

[126]FCC, Hurricane Ian: Public Notices and Orders, released September 28 - October 10, 2022, https://www.fcc.gov/ian, accessed June 21 2023.

[127]FCC, Hurricane Nicole: Communications Status Reports, released November 10 - 11, 2022, https://www.fcc.gov/nicole, accessed June 21, 2023.

[128]FCC, Hurricane Nicole: Public Notices and Orders, released November 10 - 11, 2022, https://www.fcc.gov/nicole, accessed June 21, 2023.

learned from their experiences. The second panel examined opportunities to improve wireless resiliency through better coordination with the power sector as well as innovative ideas for mitigating disaster impacts on the communications sector.[129]

To improve response and recovery efforts for future storms, the FCC has issued several orders and notices of proposed rulemaking. These recent actions enable National Security personnel to obtain prioritized connectivity during emergency situations, improve the reliability and resilience of mobile wireless networks, improve the clarity and accessibility of Emergency Alert System (EAS) visual messages, improve the security and reliability of the EAS and Wireless Emergency Alerts, and propose to more precisely route wireless 911 calls and texts to 911 call centers.[130,131,132, 133]

2. COVID-19

The increase in the use of telework, telemedicine, remote learning, and other network applications caused by COVID-19 has highlighted the importance of internet access. In response, the federal government has provided extensive support for broadband connectivity.

- The FCC's Connected Care Pilot Program provided $100 million from the Universal Service Fund over a three-year period to selected applicants to support the provision of connected care telehealth services; in Florida, the FCC awarded over $1.5 million to two projects in 2021.[134]

- The FCC's COVID-19 Telehealth Program provided $200 million in Round 1 and $256 million in Round 2 in support of telecommunications services, information services, and connected devices necessary to enable telehealth during the COVID-19 pandemic. In Florida, the FCC awarded over $15.4 million to 26 projects in 2021 and nearly $570,000 to one project in 2022.[135]

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[129]FCC, Hearing on Impact to Communications of Hurricanes Fiona and Ian, posted November 17, 2022, https://www.fcc.gov/hearing-impact-communications-hurricanes-fiona-and-ian, accessed June 21, 2023.

[130]FCC, FCC Modernizes and Improves Its Priority Services Rules, released May 20, 2022, https://www.fcc.gov/document/fcc-modernizes-and-improves-its-priority-services-rules-0, accessed June 21, 2023.

[131]FCC, FCC Acts to Improve Network Resiliency During Disasters, released July 6, 2022, https://www.fcc.gov/document/fcc-acts-improve-network-resiliency-during-disasters, accessed June 21, 2023.

[132]FCC, The Emergency Alert System (EAS), Archives, https://www.fcc.gov/emergency-alert-system, accessed June 21, 2023.

[133]FCC, FCC Proposes Rules for Location-Based Routing for Wireless 911 Calls, released December 22, 2022, https://www.fcc.gov/document/fcc-proposes-rules-location-based-routing-wireless-911-calls, accessed June 21, 2023.

[134]FCC, "WCB Releases Interim Report on Connected Care and COVID-19 Telehealth ," updated March 21, 2023, https://www.fcc.gov/document/wcb-releases-interim-report-connected-care-and-covid-19-telehealth, accessed June 21, 2023.

[135]Ibid.

- The FCC's Emergency Connectivity Fund is a $7.17 billion program that will help schools and libraries provide the tools and services their communities need for remote learning during the COVID-19 emergency period. In Florida, the FCC awarded a total of over $351 million to 542 schools, school districts, libraries, library systems and consortia beginning in 2021 through the spring of 2023.[136]

In addition to these programs, the FCC has also granted waivers for compliance with Lifeline and Affordable Connectivity Program recertification and reverification requirements for tribal subscribers residing on Tribal lands through April 30, 2023. and extended deadlines for some E-Rate services and regulatory fees.[137,138,139]

[136]FCC, Emergency Connectivity Fund, updated April 12, 2023, https://www.fcc.gov/emergency-connectivity-fund, accessed June 21, 2023.

[137]FCC, "WCB Extends COVID Waivers Impacting Lifeline, ACP Tribal Subscribers," January 30, 2023, https://www.fcc.gov/document/wcb-extends-covid-waivers-impacting-lifeline-acp-tribal-subscribers-0, accessed June 21, 2023.

[138]FCC, "WCB Extends Delivery Deadline for Certain FY2020/21 E-Rate Services," released September 19, 2022, https://www.fcc.gov/document/wcb-extends-delivery-deadline-certain-fy202021-e-rate-services, accessed June 21, 2023.

[139]FCC, "FY 2022 Regulatory Fees Waiver Public Notice," released September 29, 2022, https://www.fcc.gov/document/fy-2022-regulatory-fees-waiver-public-notice-0, accessed June 21, 2023.

Appendix - List of Certificated ILECs and CLECs as of 12/31/2022

** Indicates the company did not respond to the Commission's data request as of June 16, 2023

Accelecom GA LLC
Access One, Inc.
ACN Communication Services, LLC
Airespring, Inc.
Airus, Inc.
Allstream
Altaworx LLC
American Dark Fiber, LLC
American Telephone Company LLC
ANEW Broadband, Inc.
ANPI Business, LLC
AT&T Corp.
AT&T Florida
ATC Outdoor DAS, LLC
Atlantis Communications LLC
ATN, Inc.
Bandwidth.com CLEC, LLC
Barr Tell USA, Inc.
BCM One, Inc.
BCN Telecom, Inc.
Consolidated Communications of Florida Company
BeCru
BIF IV Intrepid OpCo LLC
Blue Stream Fiber
Branch Communications, LLC
Bright House Networks Information Services (Florida), LLC
Broadband Dynamics, L.L.C.
Broadview Networks, Inc.
Broadvox-CLEC, LLC
Broadwing Communications, LLC
BT Communications Sales LLC
BullsEye Telecom, Inc.
Business Telecom, LLC
C3
Cablevision Lightpath LLC
Callis Communications, Inc.
Campus Communications Group, Inc.
Cathect Communications Inc.**
CBTS Technology Solutions LLC
CenturyLink
City of Bartow
City of Lakeland
City of Ocala
Clear Rate Communications, LLC
Cogeco US Enterprise, LLC d/b/a Breezeline
Cogent Communications of Florida
Comcast Business Communications, LLC
Comcast Digital Phone
Communications Authority, Inc
Comtech21, LLC
Consolidated Communications Enterprise Services, Inc.
Conterra Ultra Broadband, LLC
Convergia, Inc.
CoreTel Florida, Inc.
Cox Florida Telcom, L.P.
Crexendo Business Solutions, Inc.
Crosstel Tandem, Inc.
Crosstown Fiber IL LLC**
Crown Castle Fiber LLC
CSG-Cloud, LLC d/b/a Citrus Phones**
Custom Network Solutions, Inc.
Custom Tel, LLC**
Dais Communications, LLC
Data Stream Telecom of Florida Inc.**
DeltaCom LLC
Discount CLEC Services Corporation**
dishNET Wireline L.L.C.
DSCI, LLC
EarthGrid PBC
Easton Telecom Services, L.L.C.
Easy Telephone Services Company
Embarq Communications
ENA Services, LLC
eNetworks NC, LLC
ENGAGE COMMUNICATIONS
Enhanced Communications Network, Inc.
Entelegent Solutions, Inc.
ExteNet Asset Entity, LLC
ExteNet Systems, LLC
Faster.IO, Inc.**
FiberLight, LLC
First Choice Technology, Inc.
First Communications, LLC
FL Network Transport, LLC
Florida Phone Systems, Inc.

FPUAnet Communications
France Telecom Corporate Solutions L.L.C.
Frontier Communications of America, Inc.
Frontier Communications of the South, LLC
Frontier Florida LLC
Fusion
Fusion Cloud Services, LLC
Georgia Public Web, Inc.**
GetGo Communications LLC
GIGAMONSTER NETWORKS, LLC
Gigapower, LLC (f/k/a Infrastructure Endeavors, LLC)
Global Capacity
Global Crossing Local Services, Inc.
Gold Data USA Inc.**
Granite Telecommunications, LLC
Great America Networks, Inc.
GRU Communication Services/GRUCom/GRU
GRUCom
Harbor Communications, LLC
Hargray of Florida, LLC
Hargray of Tallahassee LLC
Hayes E-Government Resources, Inc.
HD Carrier, LLC
HFA of Florida LLC
Home Town Telephone, LLC
Hudson Fiber Network Inc
inContact, Inc.
INdigital
INNOVATIVE TECH PROS**
Integrated Path Communications, LLC
Intelletrace, Inc.
Intellifiber Networks, LLC
Interactive Services Network, Inc.
InterGlobe Communications, Inc.
InterMetro Fiber, LLC
Intrado Communications, LLC
Intrado Safety Communications, Inc.
IPC Network Services, Inc.
JEA**
Keys Energy Services
Level 3 Communications, LLC
Level 3 Telecom of Florida, LP
Light Source Communications, LLC
Lightspeed CLEC, Inc.**
Lingo Telecom, LLC
Luxury Telecommunications LLC d/b/a Luxury Telecommunications
Maryland TeleCommunication Systems, Inc.
MassComm, LLC
MasTec Network Solutions, LLC**
MCC Telephony of Florida, LLC
McLeodUSA Telecommunications Services, L.L.C.
MetroNet
MetTel
Micro-Comm, Inc.
MIX Networks, Inc.
Mobilitie, LLC
MOSAIC NETWORX LLC
Motorola Solutions Connectivity, Inc.
MULTIPHONE LATIN AMERICA, INC.**
Myakka Communications, Inc.
Nebula Telecommunications of Florida LLC
NEFCOM
Neo Network Development, Inc.
Network Innovations, Inc.**
Network Telephone, LLC
Neutral Tandem-Florida, LLC
New Horizons Communications Corp.
NextCity Networks, LLC
NGA 911, L.L.C.
NOS Communications, Inc.
One Voice Communications, Inc.
Onvoy, LLC
Open Infra East Inc.
Opextel LLC d/b/a Alodiga**
PacOptic Networks, LLC
PaeTec Communications, LLC
PBX-Change
PeakNet, LLC
Peering Hub Inc.
Peerless Network of Florida, LLC
Phone Club Corporation
Pioneer Telephone
PowerNet Global Communications
Preferred Long Distance, Inc.
QuantumShift Communications, Inc.
RCLEC, Inc.
Reddot Networks Inc.
RingSquared Telecom LLC
SanTel Communications**
SBA DAS & Small Cells, LLC
Seminole Telecom of Florida, LLC
SH Services LLC**
Simwood Inc.
SKYNET360, LLC**
Smart Choice Communications, LLC
Smart City Metro
Smart City Networks, Limited Partnership
Smart City Solutions, LLC
Smart City Telecom

Southeastern Services, Inc.
Southern Light, LLC
Southern Telecom
Spectrotel of Florida LLC d/b/a Touch Base Communications
Spectrum Fiberlink Florida, LLC
SQF, LLC
Stanley Utility Contractor, Inc.
Stratus Networks, Inc.
Summit Broadband
Synergem Technologies, Inc.
T3 Communications, Inc.
TDS Telecom
Telco Experts, LLC
TelCove Operations, LLC
Telepak Networks, Inc.
TELETECH COMMUNICATIONS INC
Teliax, Inc.
Telrite Corporation
Tel-Star Communications of Florida Inc.**
Terra Nova Telecom, Inc.
TerraNovaNet, Inc.
Tillman FiberCo Florida, LLC
TIME CLOCK SOLUTIONS, LLC
Time Warner Cable Business LLC
Tone Communication Services LLC**
TotalComUSA
Touchtone Communications Inc. of Delaware
Tristar Communications Corp.**
Triton Networks LLC
Ubiquity Florida, LLC
United Commercial Telecom, LLC
Uniti Fiber LLC
Uniti National LLC
US LEC of Florida, LLC
US Signal Company, L.L.C.
USA FIBER
Vanco US, LLC**
Velocity, A Managed Services Company, Inc.**
Verizon Access Transmission Services
Verizon Select Services Inc.
Vero Networks
VoDa Networks, Inc.
Vodafone US Inc.
Voxbeam Telecommunications Inc.
WANRack, LLC
Wholesale Carrier Services, Inc.
Wide Voice, LLC
WiMacTel, Inc.
Windstream Florida, LLC
Windstream KDL, LLC
Windstream New Edge, LLC
Windstream Norlight, LLC
Windstream NuVox, LLC
Windstream Talk America, LLC
Wire 3 LLC
WonderLink Communications, LLC**
WOW! Internet, Cable and Phone
XO Communications

Glossary

5G	5G is the short name for fifth-generation wireless broadband technology. 5G provides higher bandwidth, faster speeds and coverage than the current 4G. 5G offers speeds of up to 1 Gb/s for tens of connections or tens of Mb/s for tens of thousands of connections.
Access Line	The circuit or channel between the demarcation point at the customer's premises and the serving end or class 5 central office.
Broadband	A term describing evolving digital technologies offering consumers integrated access to voice, high-speed data, video on demand, and interactive information delivery services.
C-Band	The electromagnetic radio spectrum between 4GHz and 8GHz. Specifically, 3.7-3.98GHz is being used to transmit 5G cellular data.
Circuit	A fully operational two-way communications path.
CLEC	*Competitive Local Exchange Company*. Any company certificated by the Florida Public Service Commission to provide local exchange telecommunications service in Florida on or after July 1, 1995.
Communications Act, 1996 Act or The Act	The federal Communications Act of 1934, as amended by the Telecommunications Act of 1996, established a national framework to enable CLECs to enter the local telecommunications marketplace.
Facilities-based VoIP service	VoIP service provided by the same company that provides the customer's broadband connection. Facilities-based VoIP services are generally provided over private managed networks and are capable of being provided according to most telephone standards. While this service uses Internet Protocol for its transmission, it is not generally provided over the public Internet.
Fixed Wireless Access (FWA)	Wireless broadband Internet service provided through stationary customer premise equipment that connects to a cellular network.
ILEC	*Incumbent Local Exchange Company*. Any company certificated by the FPSC to provide local exchange telecommunications service in Florida on or before June 30, 1995.
Interconnected VoIP service	According to the FCC, it is a VoIP service that (1) enables real-time, two-way voice communications; (2) requires a broadband connection from the user's location; (3) requires Internet protocol-compatible customer premises equipment; and (4) permits users generally to receive calls that originate and terminate on the public switched telephone network.

Intermodal	The use of more than one type of technology or carrier to transport telecommunications services from origination to termination. When referring to local competition, intermodal refers to non-wireline voice communications such as wireless or VoIP.
Internet Protocol (IP)	The standards that keep the Internet functioning. It describes software that tracks the Internet address of nodes, routes outgoing messages, and recognizes incoming messages.
Millimeter Wave (mmWave)	The band of electromagnetic radio frequency spectrum with wavelengths between 10 millimeters (30GHz) and 1 millimeter (300GHz) and are often associated with 5G deployments. mmWave signals are capable of high bandwidth transmission, but are limited to relatively short range, line-of-sight applications vs. longer range Wi-Fi (2.4GHz, 5GHz, 6GHz) and cellular (2.5-3.7GHz, 600MHz-700MHz) networks.
Over-the-Top VoIP service	VoIP service that is provided independently from a particular broadband connection and is transmitted via the public Internet.
Switched Access	Local exchange telecommunications company-provided exchange access services that offer switched interconnections between local telephone subscribers and long distance or other companies.
Time Division Multiplexing (TDM)	A method of transmitting and receiving independent signals over a common signal path. TDM circuit switched lines represent the traditional wireline access line data within this report and do not include VoIP connections.
Universal Service Fund	Provides compensation to communications entities for providing access to telecommunications services at reasonable and affordable rates throughout the country, including rural, insular, high-cost areas, and public institutions.
Universal Service Administrative Company (USAC)	An independent American nonprofit corporation designated as the administrator of the federal Universal Service Fund by the Federal Communications Commission. USAC is a subsidiary of the National Exchange Carrier Association.
Voice over Internet Protocol (VoIP)	The technology used to transmit voice conversations over a data network using Internet Protocol.
Wireline	Synonymous with “landline” or land-based technology for providing telephone service.

Attachment 3

State of Florida

Public Service Commission

CAPITAL CIRCLE OFFICE CENTER ● 2540 SHUMARD OAK BOULEVARD
TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: June 30, 2023

TO: Braulio L. Baez, Executive Director

FROM: Office of Industry Development and Market Analysis (Hardy, Temprano, Crawford)
Office of the General Counsel (Rubottom, Dose)

RE: Briefing on the U.S. Environmental Protection Agency's proposed rule regarding Greenhouse Gas Standards and Guidelines for Fossil Fuel-Fired Power Plants
CRITICAL INFORMATION: Please place on the July 11, 2023 Internal Affairs. Comments to the EPA are due on August 8, 2023.
COMMISSION GUIDANCE IS SOUGHT

On May 11, 2023, the U.S Environmental Protection Agency (EPA) issued a proposed rule consisting of five separate actions under Section 111 of the Clean Air Act (CAA) addressing greenhouse gas (GHG) emissions from fossil fuel-fired electric generating units (EGUs). The Florida Department of Environmental Protection (FDEP) is the primary state agency for implementing and enforcing the EPA's proposed rule. The Florida Public Service Commission (Commission) has jurisdiction over the planning, development, and maintenance of a coordinated electric power grid throughout Florida to assure an adequate and reliable source of energy. Therefore, the Commission's responsibilities over the grid and its role as the economic regulator of the investor-owned electric utilities allows it to assess the potential impact of the EPA's actions on electricity rates, reliability, and service. Staff has prepared a summary of the EPA's proposed actions, attached hereto as Attachment A. The EPA has established a deadline to accept comments on the proposed rules of August 8, 2023. Staff seeks guidance on whether to prepare draft comments on the proposed EPA rules for consideration at a future Internal Affairs meeting.

The EPA has previously identified EGUs as a category of stationary sources that cause or significantly contribute to dangerous pollution of GHGs. For each such category, Section 111 of the CAA, the New Source Performance Standards (NSPS) Program, directs the EPA to (1) determine the best system of emission reduction (BSER) that has been adequately demonstrated, (2) determine the degree of emission limitation achievable through the application of that system, and (3) impose an emissions limit on new stationary sources that reflects that amount.[1] The EPA may also regulate some existing sources under Section 111(d) of the CAA, which authorizes the

[1] *West Virginia, et al., v. EPA*, 142 S. Ct. 2587, 2601 (2022).

application of NSPS standards to existing sources if those sources are not already regulated under other sections of the CAA.

Outreach Activities

On Wednesday, June 28, 2023, Commission staff held a meeting with staff members from FDEP's Division of Air Resource Management to discuss the EPA's proposed rule concerning GHG emissions. FDEP provided insights into the Division's functions, followed by a discussion on the EPA's proposed rule. Both FPSC staff and FDEP staff expressed their commitment to maintaining open lines of communication throughout the EPA's ongoing rulemaking process.

Staff has also been in contact with various Florida stakeholders such as the Florida Reliability Coordinating Council, the Florida Electric Power Coordinating Group's Environmental Committee, Duke Energy Florida, LLC, and the National Association of Regulatory Utility Commissioners (NARUC).

EPA's Proposed Rule

The EPA's proposed actions include:

- **Emission guidelines for large and frequently used (>300 MW, >50 percent capacity factor) existing fossil fuel-fired stationary combustion turbines (primarily existing natural gas units).** The EPA's proposed emission guidelines target existing stationary combustion turbines, specifically larger and frequently used units, and offer two BSER options for compliance: carbon capture and storage (CCS) technology or gradually increasing the volume mix of co-firing low-GHG hydrogen.
- **Emission guidelines for existing fossil fuel-fired steam generating EGUs (primarily existing coal units).** The EPA is proposing emission guidelines for existing fossil fuel-fired steam generating units, with a primary focus on coal units. The proposed guidelines include dividing coal units into subcategories based on operating horizon and load level, with CCS as the BSER for long-term operating units, natural gas co-firing for units ceasing operations before 2040, and routine maintenance for units ceasing operations before either 2035 or 2032, depending on the subcategory of the unit.
- **Standards for new, reconstructed, and modified coal units.** To ensure consistency with emission guidelines for existing units, the EPA will maintain the current standards for new and reconstructed coal units due to the absence of anticipated future construction, while proposing to revise the standards for modified coal units, that have undergone modifications subject to the NSPS, to align with the BSER utilizing CCS technology and a 90 percent capture rate for CO2.
- **Updates to the NSPS for fossil fuel-fired stationary combustion turbines (primarily new natural gas units).** The EPA has identified three general subcategories of stationary combustion turbines, namely low load "peaking" turbines, intermediate load turbines, and base load turbines. For each subcategory, the EPA is proposing standards of performance that will require emissions reductions equivalent to what is achievable by the use of an identified BSER, ranging from using lower emitting fuel, co-firing with low-GHG hydrogen, and implementing CCS.

- **Repeal of the Affordable Clean Energy (ACE) Rule which was adopted by the EPA in 2019 and repealed the Clean Power Plan**

Next Steps

Staff believes the potential impacts to Florida's utilities and ratepayers resulting from the EPA's proposed rule could be substantial. Specifically, staff has several concerns at this time with the EPA's proposed rule:

(1) It is unclear how many EGUs in Florida would be affected by these actions. In the EPA's proposed rule, they did not specify the method of calculating MW capacity and capacity factor for purposes of determining whether an EGU would be regulated under these proposals. The EPA did issue additional guidance on this matter, but it remains uncertain which EGUs may be affected by the proposed rule.
(2) Staff is concerned that EPA's proposed rule does not give EGU operators sufficient time and flexibility for compliance, which could result in excess compliance costs that would be recovered from customers through rates.
(3) It is unclear whether the EPA's proposed BSER of CCS and co-firing with low-GHG hydrogen has been adequately demonstrated[2] for use in Florida due to the current level of available technologies and due to certain ecological and environmental factors particular to Florida that may impact their adoption in the state.
(4) No Florida utility has successfully demonstrated a cost-effective CCS project or co-fired the required volume of low-GHG hydrogen. In addition, it is unclear where EGUs could source sufficient volume of low-GHG hydrogen to co-fire at compliant levels, or whether the proposed rule would necessitate a substantial investment in hydrogen production and distribution infrastructure.

In addition to the concerns listed above, EPA has also requested feedback from stakeholders on certain areas related to its proposed actions, as detailed on pages 7-8 of Attachment A.

Staff therefore seeks Commission guidance on whether to draft comments on the EPA's proposed rule for consideration at a future Internal Affairs meeting. Staff notes that comments are due to the EPA by August 8, 2023, and the next Internal Affairs meeting is scheduled for August 1, 2023.

cc: Keith Hetrick, General Counsel
Mark Futrell, Deputy Executive Director, Technical

[2] The CAA directs that the BSER technology upon which the EPA bases the emissions limit must be "adequately demonstrated," taking into account cost, health, environmental, and energy factors. *See* CAA Section 111(a)(1); 42 U.S.C. §7411(a)(1). Although neither the CAA nor the U.S. Supreme Court have defined the term "adequately demonstrated," the U.S. Court of Appeals for the D.C. Circuit has stated that the EPA cannot base its determination on a "crystal ball inquiry," but may "look toward what may fairly be projected" to be available "rather than the state of the art at present." *Portland Cement Ass'n v. Ruckelshaus*, 486 F. 2d 375, 391 (D.C. Cir. 1973). The BSER must be shown to be reasonably "reliable," "efficient," and "expected to serve the interests of pollution control without becoming exorbitantly costly." *Essex Chem. Corp. v. Ruckelshaus*, 486 F. 2d 427, 433 (D.C. Cir. 1973).

Apryl Lynn, Deputy Executive Director, Administrative

Summary of EPA's Proposed Rule: Greenhouse Gas Standards and Guidelines for Fossil Fuel-Fired Power Plants

Background

Section 111 of the Clean Air Act (CAA) is known as the New Source Performance Standards (NSPS) Program and allows the U.S. Environmental Protection Agency (EPA) to establish federal standards of performance for certain categories of stationary sources that it determines cause or significantly contribute to dangerous air pollution. For each pollutant emitted by an identified source category, Section 111 directs the EPA to (1) determine the best system of emission reduction (BSER) that has been adequately demonstrated,[3] (2) determine the degree of emission limitation achievable through the application of that system, and (3) impose an emissions limit on new stationary sources that reflects that amount.[4] The EPA may also regulate some existing sources under Section 111(d) of the CAA, which authorizes the application of NSPS standards to existing sources if those sources are not already regulated under other sections of the CAA.

A source regulated by the NSPS Program generally has discretion in how to achieve the emissions limit established by the EPA's numerical standard of performance, provided that its pollution levels are no greater than the amount achievable through the application of the BSER.[5] However, the EPA may promulgate a particular design, technology, or operational standard if it finds that it is not feasible to prescribe or enforce a standard of performance to achieve the established emissions limit.[6]

Once the EPA has imposed an emissions limit on stationary sources under the NSPS process, each state may develop an implementation and enforcement plan.[7] If the EPA approves the state implementation plan, it must delegate to the state any authority it has to enforce the established NSPS emissions limits.

In 2015, the EPA established greenhouse gas (GHG) emission standards for steam generating units and stationary combustion turbines under the NSPS program of the CAA Section 111(b) and finalized the Clean Power Plan (CPP) that regulated GHG emissions from electric generating units (EGUs) under Section 111(d) of the CAA. However, in 2019, after extensive legal

[3] The CAA directs that the BSER technology upon which the EPA bases the emissions limit must be "adequately demonstrated," taking into account cost, health, environmental, and energy factors. *See* CAA Section 111(a)(1); 42 U.S.C. §7411(a)(1). Although neither the CAA nor the U.S. Supreme Court have defined the term "adequately demonstrated," the U.S. Court of Appeals for the D.C. Circuit has stated that the EPA cannot base its determination on a "crystal ball inquiry," but may "look toward what may fairly be projected" to be available "rather than the state of the art at present." *Portland Cement Ass'n v. Ruckelshaus*, 486 F. 2d 375, 391 (D.C. Cir. 1973). The BSER must be shown to be reasonably "reliable," "efficient," and "expected to serve the interests of pollution control without becoming exorbitantly costly." *Essex Chem. Corp. v. Ruckelshaus*, 486 F. 2d 427, 433 (D.C. Cir. 1973).
[4] *West Virginia, et al., v. EPA*, 142 S. Ct. 2587, 2601 (2022).
[5] *Id.*
[6] CAA Section 111(h); 42 U.S.C. §7411(h).
[7] CAA Section 111(c)-(d); 42 U.S.C. §7411(c)-(d).

challenges, the EPA repealed and replaced the CPP with the Affordable Clean Energy (ACE) Rule. The ACE Rule was subsequently challenged in court. In 2021, the D.C. Circuit Court vacated the ACE Rule, which also included the repeal of the CPP. However, in 2022, the U.S. Supreme Court reversed the vacatur of the ACE Rule and upheld the repeal of the CPP.[8]

On May 11, 2023, the EPA proposed five separate actions under Section 111 of the CAA that relate to carbon pollution standards for coal- and gas-fired power plants. The EPA's proposed actions aim to improve the emissions performance of EGUs and reduce GHG emissions from power plants and other stationary sources. The EPA's proposed actions include:

(1) Emission guidelines for large and frequently used (>300 MW, >50 percent capacity factor) existing fossil fuel-fired stationary combustion turbines (primarily existing natural gas units)
(2) Emission Guidelines for Existing Fossil Fuel-Fired Steam Generating EGUs (primarily existing coal units)
(3) Updates to the NSPS for fossil fuel-fired stationary combustion turbines (primarily new natural gas units)
(4) Standards for new, reconstructed, and modified coal units
(5) Repeal of the ACE Rule

The proposed standards for each EGU subcategory are based on the EPA's evaluation of the feasibility, emissions reductions, and cost-reasonableness of available controls. According to Section 111(a) of the CAA, the EPA must, "tak[e] into account the cost of achieving such reduction and any nonair quality health and environmental and energy requirements."[9] The EPA's goal is to identify the most effective emission reduction technologies and practices for each type of stationary combustion turbine. By implementing these standards, the EPA aims to ensure that new and reconstructed fossil fuel-fired stationary combustion turbine EGUs meet stringent emissions requirements while considering factors such as feasibility and cost-effectiveness.

Emission Guidelines for Large and Frequently Used (>300MW, >50 percent capacity factor) Existing Fossil Fuel-Fired Stationary Combustion Turbines (Primarily Existing Natural Gas Units)

The EPA is proposing emission guidelines for existing stationary combustion turbines, specifically targeting large and frequently used units with a capacity greater than 300 megawatts (MW) and a capacity factor exceeding 50 percent.

The BSER for these existing units is based on two options. The first option involves achieving a 90 percent capture of CO2 using carbon capture and sequestration/storage (CCS) technology by

[8] *West Virginia v. EPA*, 142 S. Ct. at 2616.
[9] CAA Section 111(a); 42 U.S.C. §7411(a).

the year 2035. The second option focuses on co-firing low-GHG hydrogen, starting with a 30 percent volume mix of low-GHG hydrogen by 2032 and gradually increasing it to 96 percent volume mix by 2038.

The EPA has defined low-GHG hydrogen as that produced with less than 0.45 kilograms of CO2 equivalent overall emissions per kilogram of hydrogen. This measurement considers the entire production process, from the extraction of input feedstock to the exit gate of the hydrogen production facility, also known as "well-to-gate." The EPA's definition of low-GHG hydrogen is consistent with the Congressional definitions provided in section 45V(b)(2)(D) of the Inflation Reduction Act.[10] The EPA's definition may ensure that only lowest-GHG hydrogen can qualify as part of the combustion turbine co-firing BSER.

Table 1 in the Appendix presents the GHG standards for existing stationary combustion turbines.

Emission Guidelines for Existing Fossil Fuel-Fired Steam Generating EGUs (Primarily Existing Coal Units)

The EPA is proposing new emission guidelines for existing fossil fuel-fired steam generating EGUs, primarily focusing on existing coal units, through the application of CCS technology and natural gas co-firing as means to reduce GHG emissions.

The EPA's proposed BSER for coal-fired steam EGUs that will operate in the long-term (beyond December 31, 2039) is the use of CCS with a 90 percent capture rate of CO2. This approach is expected to achieve an 88.4 percent reduction in emission rate. The EPA has determined that CCS satisfies the BSER criteria for these sources due to its demonstrated effectiveness in achieving significant reductions in GHG emissions and its high cost-effectiveness.

While the EPA considers CCS to be a broadly applicable BSER, it recognizes that the cost-effectiveness of implementing CCS depends on the operating lifespan of the plant. In response to industry input, the EPA is proposing to divide the subcategory for coal-fired units into additional subcategories based on the operating horizon (i.e., the date for electing to permanently cease operation) and, for one of those subcategories, the load level (i.e., annual capacity factor). Each subcategory would have a separate BSER and degree of emission limitation based on what is deemed cost-effective and achievable for existing plants in that particular subcategory.

For units that choose to permanently cease operations before January 1, 2040, and do not fall into other subcategories, the proposed BSER is co-firing 40 percent natural gas on a heat input basis. The EPA estimates this approach could lead to a 16 percent reduction in emission rate.

For units that choose to permanently cease operations before January 1, 2035, and commit to operate with an annual capacity factor limit of 20 percent, the proposed BSER is routine methods

[10] Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818.

of operation and maintenance. The associated degree of emission limitation is no increase in emission rate.

For units that choose to permanently cease operations before January 1, 2032, the proposed BSER is routine methods of operation and maintenance. Again, the associated degree of emission limitation is no increase in emission rate.

In addition to coal-fired units, the EPA is also proposing emission guidelines for natural gas- and oil-fired steam generating units. These guidelines include further subcategorization based on capacity factor. For each proposed subcategory, the BSER is routine methods of operation and maintenance, and the degree of emission limitation is no increase in emission rate.

Table 2 in the Appendix presents the GHG standards for existing fossil fuel-fired steam generating EGUs.

Updates to the New Source Performance Standard for Fossil Fuel-fired Stationary Combustion Turbines (Primarily New Natural Gas Units)

The EPA is proposing updates to the NSPS for GHG emissions from new and reconstructed fossil fuel-fired stationary combustion turbine EGUs. The proposed standards aim to establish more protective regulations by incorporating highly efficient generating practices, along with the use of CCS or co-firing low-GHG hydrogen.

The proposed standards affect new and reconstructed fossil fuel-fired stationary combustion turbines that commence construction or reconstruction after the date of publication of the proposed rule in the Federal Register.

The EPA has identified three general subcategories of stationary combustion turbines, namely low load "peaking" turbines, intermediate load turbines, and base load turbines. For each subcategory, the EPA is proposing a BSER and a standard of performance. Table 3 in the Appendix presents the GHG standards for all three subcategories of combustion turbines.

Low Load "Peaking" Combustion Turbines

The EPA has proposed specific BSER and standards of performance for low load "peaking" combustion turbines that involves the use of lower emitting fuels such as natural gas or distillate oil. Low load turbines are designated as those having a capacity factor below 20 percent. The EPA aims to establish standards of performance that will limit CO2 emissions from these turbines to a range of 120 to 160 pounds of CO2 per one million British thermal units (lbs. CO2/MMBtu), depending on the type of fuel used. These standards are designed to promote the use of cleaner fuels and reduce the carbon footprint associated with low load "peaking" combustion turbines.

Intermediate Load Combustion Turbines

The EPA has proposed a comprehensive approach for intermediate load combustion turbines, consisting of two components to be implemented in two phases. Intermediate load combustion turbines have a capacity factor that ranges between 20 percent and a source-specific upper bound based on the design efficiency of the combustion turbine which has not been defined by the EPA's proposed rule

The first component of the BSER for intermediate load combustion turbines is focused on highly efficient generation, which is an emission rate of 1,150 lbs. CO2/MWh-gross. The EPA aims to promote the use of highly efficient natural gas-fired simple cycle turbines during the first phase.

The second component of the BSER is intended to further reduce GHG emissions by co-firing low-GHG hydrogen with natural gas in the turbines. By 2032, the proposed standards for intermediate load combustion turbines suggest the co-firing of 30 percent (by volume) low-GHG hydrogen with natural gas to achieve a gross CO2 emissions rate of 1,000 pounds per megawatt-hour (MWh).

It is important to note that the proposed standards would be adjusted for combustion turbines burning non-natural gas fuels with higher emission rates on a lbs. CO2/MMBtu basis. This differentiation ensures that the standards appropriately account for the varying emission characteristics of different fuels used in intermediate load combustion turbines.

Base Load Combustion Turbines

Base load combustion turbines are categorized by the EPA as combustion turbines that operate above the upper-bound threshold for intermediate load turbines which has not been defined by the EPA's proposed rule. Sources are given two pathways for future compliance: CCS or co-firing hydrogen. The proposed standards for base load combustion turbines vary depending on the phase and pathway. Overall, the EPA's proposal for base load combustion turbines outlines a phased approach that includes highly efficient generation, CCS, and low-GHG hydrogen co-firing.

The first phase of the BSER applies to all sources and focuses on highly efficient generation, which is an emission rate range from 770 to 900 lbs. CO2/MWh, depending on the base load rating. These standards are based on the performance of highly efficient natural gas-fired combined cycle combustion turbines. Phase two includes two options for the BSER pathway: CCS or co-firing low-GHG hydrogen.

CCS Pathway

For sources on the CCS pathway, the second component of the BSER requires achieving 90 percent CCS by 2035.

Low-GHG Hydrogen Pathway

For sources on the low-GHG hydrogen pathway, the second and third components of the BSER involve co-firing low-GHG hydrogen. In the second phase, base load units are required to co-fire 30 percent (by volume) low-GHG hydrogen by 2032. The third phase standards suggest base load units to co-fire 96 percent (by volume) low-GHG hydrogen by 2038. The second phase standards are set at 680 lbs. CO2/MWh-gross, based on the performance of highly efficient natural gas-fired combined cycle combustion turbines co-firing 30 percent low-GHG hydrogen by 2032.

Standards for New, Reconstructed, and Modified Coal Units

The EPA has decided to maintain the existing standards for new coal units, standards which were established in 2015 and are based on the use of CCS technology. These standards suggest new coal units to implement CCS to achieve an emission of 1,400 CO2/MWh-gross.[11] Similarly, the standards for reconstructed coal units, also based on efficiency, will remain unchanged.

The EPA has determined that there is no need to review or revise the standards for new and reconstructed coal units because they anticipate no further construction of such units in the future. The EPA's 2023 "*Power Sector Trends"* Technical Support Document states "the last year in which a new coal-fired EGU (greater than 25 MW) was completed was in 2014 [and] there are no new announced plans to build new coal-fired EGUs." [12]

However, the EPA has reviewed the standards for modified coal units, which are existing units that undergo modifications that could potentially subject them to the NSPS. To ensure consistency with the emission guidelines for existing units, the EPA is proposing to revise the standards for modified coal units to be based on the BSER of CCS with a 90 percent capture rate for CO2.

By basing the standards for modified coal units on the same BSER as the emission guidelines for existing units, the EPA intends to maintain consistency and ensure that any existing units that undergo modifications and become subject to the NSPS will be held to the same emission reduction standards as the units covered by the guidelines.

Table 4 in the Appendix presents the GHG standards for new, reconstructed, and modified coal units.

[11] *See* Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, https://www.govinfo.gov/content/pkg/FR-2015-10-23/pdf/2015-22837.pdf.

[12] *See* EPA's 2023 "Power Sector Trends" Technical Support Document, https://www.epa.gov/system/files/documents/2023-05/Power%20Sector%20Trends%20TSD.pdf.

Repeal of the ACE Rule

The EPA is proposing to repeal the ACE Rule. The EPA's proposal is based on the assumption that the emission guidelines set forth in the ACE Rule do not align with the proposed BSER for steam generating EGUs. Additionally, the EPA alleges that the ACE Rule is inconsistent with Section 111 of the CAA in other aspects. As a result, the EPA has determined that it is necessary to repeal the ACE Rule.

State Plans for Proposed Emission Guidelines

Under Section 111(d) of the CAA, states are required to submit plans to the EPA that establish standards of performance for existing sources. The proposed emission guidelines serve as a framework for these state plans, ensuring consistency and effectiveness. The Florida Department of Environmental Protection would be responsible for developing a state plan and submitting it to the EPA.

The state plan components must include requirements specific to these guidelines to promote transparency. For instance, owners/operators of EGUs would need to establish a website to publish documentation and information related to compliance.

When establishing standards of performance for emission guidelines, states must use the EPA's degree of emission limitation as a baseline emission rate for affected EGUs. The proposed methodology suggests using any continuous eight-quarter period within the five years prior to the final rule's publication in the Federal Register as the baseline for CO2 emissions.

The EPA's proposed rule allows for compliance flexibilities, including trading and averaging mechanisms, for state plans under these emission guidelines. While not mandatory, states can choose to include these mechanisms, provided they maintain equivalent stringency to ensure that individual sources are meeting its standard of performance.

The proposal also addresses the consideration of remaining useful life and other factors in setting less stringent standards. States can use the EPA's framework to demonstrate that facilities cannot reasonably achieve the level of emission limitation through the application of the BSER.

The EPA's proposed rule includes requirements to ensure meaningful engagement. According to the proposed rule, states would be required to involve stakeholders, particularly communities most affected and vulnerable to EGU emissions. This would provide those communities an opportunity for their concerns, priorities, and perspectives to be heard during the planning process.

According to the proposed rule, states must submit their plans within 24 months of the emission guidelines' effective date. Compliance deadlines are proposed for existing steam generating units by January 1, 2030, and for existing combustion turbine units by either January 1, 2032, or January 1, 2035, depending on the subcategory.

Staff notes that on December 14, 2022, the EPA proposed updates to the timelines and other requirements for state plans to limit pollution from existing sources under Section 111(d) of the CAA. The EPA proposed revisions to the implementation regulations for 40 Code of Federal Regulations part 60, subpart Ba, would apply to these guidelines if finalized.

EPA's Solicitation of Comments

The EPA is seeking additional input and feedback on various aspects of the proposed emission guidelines.

First, the EPA is seeking public input and comments on how it should address its legal obligation to establish emission guidelines for other categories of existing fossil fuel-fired combustion turbines not covered by this specific proposal. These include smaller, frequently used existing combustion turbines, and less frequently used existing combustion turbines that currently fall outside the scope of the proposed guidelines.

Second, the EPA is soliciting comments on potential variations to the subcategories and determinations of BSER, as well as the degrees of emission limitation and standards of performance associated with them. Of particular note, EPA solicits comments on "whether the BSER for new low load combustion turbines should be the use of high efficiency simple cycle technology" or whether "it would be appropriate to promulgate… a design standard pursuant to CAA section 111(h)." If the EPA adopts a design standard rather than a standard of performance, states and stationary sources would be required to apply the particular design and would not have the same flexibility in how to achieve the required emissions reduction limit as under the ordinary NSPS regulatory process.

Third, the EPA is taking comment on what limitations or requirements should apply to ensure that trading and averaging mechanisms are at least as protective as the EPA's emission guidelines. If the EPA determines that trading and averaging are appropriate, states would not be required to allow for such compliance mechanisms in their state plans but could elect to include them.

Finally, the EPA is specifically requesting comments on BSER options and degrees of emission limitation for existing fossil fuel-fired stationary combustion turbines that are not included in the proposed guidelines. These are turbines that do not fall under the category of large, frequently operated turbines.

The EPA's initial comment deadline was on July 24, 2023. On June 12, 2023, the EPA granted an extension on the comment deadline to August 8, 2023. Staff notes that on June 15 and 16, 2023, Florida Electric Power Coordinating Group, Inc.'s Environmental Committee (FCG-EC) and The Florida Reliability Coordinating Council, Inc. (FRCC), respectively, submitted requests for the EPA to extend the comment deadline from August 8, 2023, to October 9, 2023. In the FCG-EC and FRCC requests, they stated the proposed rule would have a substantial impact on

electric utilities and raises numerous complex issues that require more time to understand, such as determining which large and frequently used existing fossil fuel-fired stationary combustion turbines may be affected.

Appendix

Proposed GHG Standards for Fossil Fuel-Fired Power Plants

Table 1: Existing Large, Frequently Used CT (>300 MW, >50% capacity factor)[13]

BSER	Compliance Date
90% CCS	2035
OR	
30% hydrogen co-fire	2032
96% hydrogen co-fire	2038

Table 2: Existing Steam Generating EGUs

Source	BSER	Compliance Date
Coal: in service after 2039	90% CCS	2030
Coal: retire before 2040	40% natural gas co-fire	2030
Coal: retire before 2035	No increase in emissions[14] & <20% capacity factor	
Coal: retire before 2032	No increase in emissions	
Natural Gas & Oil-fired	No increase in emissions	

Table 3: New Source CT (primarily natural gas, not expecting new coal)

Source	BSER		Compliance Date
Peaking	Lower Emitting Fuel (120-160 lb. CO2/MMBTU)		
Intermediate	Phase 1: Highly Efficient Operation	Phase 2: 30% hydrogen co-fire	2032
Base Load	Phase 1: Highly Efficient Operation	Phase 2: 90% CCS	2035
		OR	
		30% hydrogen co-fire	2032
		96% hydrogen co-fire	2038

Table 4: New, Reconstructed, Modified Coal Units

Source	BSER
New	2015 Standards for CCS
Reconstructed	2015 Standards for Efficiency
Modified	90% CCS

[13] Seeking comment on standards for smaller existing CTs.
[14] Routine methods of operation and maintenance.

II. Outside Persons Who Wish to Address the Commission at Internal Affairs

Note: The records reflect that no outside persons addressed the Commission at this Internal Affairs meeting.

III. Supplemental Materials for Internal Affairs

Note: The records reflect that there were no supplemental materials provided to the Commission during this Internal Affairs meeting.

IV. Transcript

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

PROCEEDINGS: INTERNAL AFFAIRS

COMMISSIONERS PARTICIPATING: CHAIRMAN ANDREW GILES FAY
COMMISSIONER ART GRAHAM
COMMISSIONER GARY F. CLARK
COMMISSIONER MIKE LA ROSA
COMMISSIONER GABRIELLA PASSIDOMO

DATE: Tuesday, July 11, 2023

TIME: Commenced: 10:50 a.m.
Concluded: 12:15 p.m.

PLACE: Betty Easley Conference Center
Room 148
4075 Esplanade Way
Tallahassee, Florida

REPORTED BY: DEBRA R. KRICK
Court Reporter and
Notary Public in and for
the State of Florida at Large

PREMIER REPORTING
114 W. 5TH AVENUE
TALLAHASSEE, FLORIDA
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P R O C E E D I N G S

CHAIRMAN FAY: All right. If we could get everyone to grab their seats, we will begin our Internal Affairs meeting this morning for July 11th.

I wanted to first recognize our employee of the month for the agency. So Donna Brown started with PSC as a staff auditor in the Bureau of Auditing in 2008. She's worked as an analyst in AFD for a brief period before returning to APA as a supervisor in the Financial Review section of the Bureau of Auditing.

As soon as she jumped into that role, she had to hit the ground running because the workload and some backlog that needed to be taken care of was a heavy lift, and so she worked 50, 60 hours a week during that, for months, during that entire process to get that division caught up to where we needed to be. She also probably most importantly continues to do all the small things that benefit the agency, and has proven to be dedicated repeatedly to our agency.

So with that, if you could join me, Commissioners, in recognizing Donna Brown as our employee of the month.

(Applause from the audience.)

CHAIRMAN FAY: All right. With that, Commissioners, we will move next into our presentation this morning from EPRI. This will be an introduction to hydrogen presented by Neva Espinoza, the Vice-President of Energy Supply in Low-Carbon Resources, and Jeffrey Preece -- did I get that right -- Director of Clean Energy and Research Development, Electric Power Institute.

I appreciate you both taking the time to be here. I feel like on a national level, in working with NARUC, EPRI continues to be one of these entities that stands out as constantly developing research and looking at areas that maybe are somewhat new to the adoption of the energy field, and so we appreciate you taking the time today.

We will have you present to us, and then typically towards the end, our Commissioners will have questions will ask if they find something in particular on a slide, they may interject just to have more information on that one particular slide, but when you are ready, we will recognize you to begin your presentation.

MS. ESPINOZA: Wonderful. Thank you so much, Chairman Fay and Commissioners, we very much

appreciate --

CHAIRMAN FAY: And your green light is on, just to make --

MS. ESPINOZA: It is. It is on.

CHAIRMAN FAY: Perfect. Okay.

MS. ESPINOZA: Can you hear me okay?

CHAIRMAN FAY: Yeah. Go ahead.

MS. ESPINOZA: Okay. So we very much appreciate being invited here today to just talk a little bit around the energy transition, some of what we are seeing globally, where we see surgery technologies, and really dig a little bit into hydrogen, specifically low-carbon hydrogen, and the role that may potentially play in our future energy system.

I will say, we would welcome any conversations, questions throughout. So we have a slide deck which has been provided to all of you, it has some heavy, pretty meaty content in there, so please do not mess hesitate to just stop us and ask questions as we go.

So just to get started, and I know that the Commission is familiar with EPRI. We've worked, as Chairman Fay mentioned, with you and presented many things to you many times, but for the benefit of

everyone in the room, just a little bit of who EPRI is.

So EPRI is a nonprofit research and development organization that focuses on energy. And I think we all know not all nonprofits act and behave exactly the same. So EPRI is a 501(c)(3) nonprofit, which means we are here for the public benefit. So we do our research to help ensure safe, reliable, affordable, resilient and environmentally responsible energy, really pushing towards a clean energy transition in the coming decades.

We are a global organization. We engage with about 400 companies around the world. And some of the core things that are really important to us are independence, objectivity, and technical rigor and science behind everything that we talk about.

So all of the content that we have here today is backed by years of research, much of which is publicly availability. And we are way happy to provide and follow up any of that information as needed as we get into some of these details on a very, very complex topic, meaning the energy transition, as well as the role hydrogen will play.

So as we get into this conversation around

hydrogen, we just thought it would be helpful to start with a little bit of context around the future energy system, what does this energy transition look like, and why is it so complex?

So first of all, many of the times when we talk about the energy transition, we are really talking about decarbonation, right? Reducing the carbon intensity of energy to achieve a net-zero economy, which I think many people know is part of our overall goal here in the United States and globally in many countries over the next few decades.

But decarbonation is really just one piece of what we need to accomplish. We need to do that in a way we are able to maintain the affordability and the reliability of the energy system. And the electric sector is going to become increasingly more important as playing a larger and larger role in part of the overall energy economy in the coming decades. It is one of the key pathways to economy-wide decarbonation, and it has been the leading sector in term of the economy-wide decarbonation over the past two decades.

So although we focus a lot of this conversation around hydrogen around decarbonation,

we can't lose the importance and the integration of balancing priorities of decarbonation, reliability, resilience, which will become more and more important as we look at how our energy system is going to become more and more digitalized, as we are seeing more and more severe weather changes, and, of course, reliability of that system.

So we are going to dive down this decarbonation path, we will bring back in reliability and resilience comments throughout, but they need to be considered as part of the overall picture.

Okay, so decarbonization. So I think we are all pretty familiar with how do we look at decarbonizing, not just the electric sector, but how do we look at decarbonizing the entire energy economy? And EPRI really focuses around core four -- four core pillars in order to enable them.

The first, which is never really talked about maybe as much as it should be, although there has been a ton of headway and progress there, is energy efficiency. It will continue to be a really important part of economy-wide decarbonation in the coming decades.

The next is cleaner electricity. Continuing

to reduce the carbon intensity of the electric sector as we go through mid-century. The next piece of that is using that cleaner electricity to electrify other parts of the economy. And what people most -- most often think of is, of course, electric vehicles, and things like heating in their homes. So it's a good kind of first step into electrification. But those three pieces alone will not be enough to achieve entire economy-wide decarbonization, right?

So there is easily 40 to 60 percent of the economy that may need another solution beyond electrification in order to decarbonize, and that's where we introduced this idea of low-carbon fuels.

So when we talk about low-carbon resources, or low-carbon fuels, we are specifically talking about things like hydrogen, ammonia, synthetic fuels and biofuels, where today we will focus arranged hydrogen.

Hydrogen is part of the energy economy today. Don't let anybody trick you. We all know that. However, hydrogen today is a part of a high-carbon energy economy, which Jeffrey will get more into, because it's produced in a way that creates a lot of CO2 emissions. So when we think about the

hydrogen and derivative products that will be used in the energy system tomorrow, we are talking a hydrogen that is produced in a way that is a low-carbon hydrogen and a low-carbon energy carrier.

So when we look at the pathways in order to achieve economy-wide decarbonization, there are a couple of things that maybe don't get talked about as much as they need to. Timing, scale, and infrastructure. Those three things are going to be really, really critical to seeing our entire economy here in the United States achieve net-zero.

So when you look at the pathways to achieve that in the different sectors of the economy, and you can see it here on the slide, we look at what have we achieved in the United States as an economy over the past two decades? And it's actually -- it's a big achievement. So we've reduced about 16 percent CO2 emissions economy-wide from 2000 to 2020 here in the United States.

That was primarily driven by the green line, the electric sector, which reduced its overall CO2 emissions about 35 or so percent in that timeframe. Now, that reduction was driven by a transition from coal to gas, integration of renewable resources,

and continuing to operate our zero-carbon, hydro and nuclear fleets.

When we look at the other sectors of the economy, transportation and industry and buildings, you clearly do not see the impact in terms of CO2 reductions over the past two decades.

Now, when we look at the achieving the U.S. goals of 50 percent economy-wide reduction by 2030, all the way to a net-zero reduction by 2050, it's going to take a much more aggressive pathway in order to get there. The electric sector will lead much of that pathway as we electrify both the industry and building sector and transportation sectors of the economy, and then we will need other fuels in order to achieve the net-zero pathway.

So when we look at this just graphic alone, I think it's pretty clear that the goals are aggressive that are out there, but more than that, the technologies needed to meet those goals are not available today at the scale or the cost we need them to be. And the bottom line is technology takes a really long time to develop.

So when we look at technology, a history of technology from concept through development, demonstration, market deployment,

commercialization, and then we have to scale and build these things, it easily takes three, four, even five decades in many cases. And when you look at the, kind of the bottom of this graphic, you see, well, what are the technologies that are coming onto the system to achieve net-zero, and it's things like advanced nuclear, clean hydrogen, carbon capture and utilization sequestration. All of those things still need time to develop to actually be scaled as an economy-wide solution.

But the challenge is not just the amount of time it takes technology to develop, because we will certainly get there, right? We are -- there is a lot of money, a lot of resources, a lot of research, a lot of projects being announced that will start to further develop those technologies and drive down the cost. It is also a question of how does the system operate?

So if you think about our energy system today, although it is more integrated than it has ever been, it's still actually quite simple. So when we think about the energy system, we have primary energy. That's things like the sun and the wind and the water. Natural gas, like, fossil fuels, uranium, right? Those are primary energy sources.

We take those energy sources and we move them to where we need to use them.

Some of those things, like natural gas, we use as an energy carrier. We find natural gas. We take it forward, and we use it in our end use of the economy. Other things, like electricity, we take a primary energy source, we convert it to electricity as an energy carrier, and we use electricity, like, to turn on our lights.

So this energy system today, 80 plus percent of this energy system today in the United States, as well as around the world, the primary energy source is a fossil fuel, and 21 percent of the end use of that energy comes from electricity.

So when we think about how does this energy system, which is 80 percent run by a fossil fuel, evolve to an energy system that is now net-zero CO2 emissions, you are really talking about how do you abandon, manage and mitigate CO2 as part of that process. And what that means is this energy system is going to become a whole lot -- oops -- a whole lot more complex than it was.

Now, don't follow the lines on this graph. The lines are not meant to be followed. They are meant to give you a headache, and just show the

complexity of evolving this energy system is going to take more than technology, but it's going to take true integration across energy systems where different parts of the energy economy will now have to behave very differently. And that will take significant infrastructure build-out, not just of pipelines, but of transmission systems, of electric systems, of different types of pipelines, whether they be CO2 pipelines, hydrogen pipelines, natural gas pipelines, et cetera, and the ability to sequester carbon, which is also a whole new infrastructure development.

So when we think about the energy transition, and what it actually takes to get from where we are today to where we need to be at that end point, timing, scale and infrastructure all become a very, very large part of the conversation.

So when we dive into, well, what is the role hydrogen plays here? How does hydrogen become part of this larger energy economy? You tend to read a lot out there about hydrogen as a technology, and this proj -- this electrolyzer project, or this blending project. But hydrogen is not just a technology, it is a whole new part of an energy economy.

Hydrogen needs to be produced in a low-carbon way. It needs to be stored and delivered, not so dissimilar to maybe how we store natural gas today, or even how we store and deliver electricity today, different ways to do it but the same concept. And then it has to be used in parts of the economy that it is not used today, which will take a significant amount of evolution of those end uses in order to do that.

So I just wanted to give a little bit of framing and context. I am going to turn it over to my colleague Jeffrey here, who is going to dive a bit more into the ins and outs of hydrogen, and some of what we see with that technology today.

MR. PREECE: Thank you, Neva. Thank you, Mr. Chairman and Commissioners. It's a pleasure to be here with you today.

We see that there are three critical aspects to understanding the role of hydrogen, and importantly, accelerating its deployment in order to achieve decarbonization goals, again, in line with over all missions of reliability, affordability, energy equity and other key comments. Those three areas are first clarifying hydrogen's role.

Hydrogen, you could say, gets a lot of hype. There is a lot of excitement. There is a lot of potential. It's certainly the forefront of many conversations in the energy sphere today. But hydrogen will play a very specific role in certain parts of our energy economy. Much like any technology, it should not be viewed as a silver bullet or a firm solution to every potential decarbonization pathway, because hydrogen right now is an expensive module to make. It can be a fuel and an energy carrier. We use it in our energy economy today. But going forward being, we have to view hydrogen more specifically in terms of its potential role against other options to decarbonize.

And that's not always an easy task, because, as Neva mentioned, you have to understand the full value chain of hydrogen. Where it's made. How it's made. Where it's going. How it's stored and used. And every point along that value chain introduces a decision-maker, a customer perspective, infrastructure, policy, regulation, you name it, it's going to touch everything, much like electricity does today.

The second area, very much related, is the

regional engagement. Hydrogen has the potential to deploy across our country, but at scale, certainly in these early decades of its full economy-wide potential, will likely focus on specific regions where infrastructure, workforce, technology and other aspects are available to support this transition in an affordable and reliable way.

With that comes helping the community around those regions understand the role of hydrogen versus other technologies. We are beginning to see, as an example around electrification, new adoption and understanding in electric vehicles.

There have been hydrogen vehicles in the marketplace, not the mass marketplace, but in the marketplace around the world for decades. But likely, we will see early adoption continue into EVs, perhaps some niche areas for hydrogen, but in a sense, it's the same type of education and information that need to be shared with general stakeholders and the community at large, what is hydrogen? The safety aspects certainly. The training around handling it and managing within how it's produced and used, but also from a social and environmental justice perspective.

So much like many of decarbonization efforts,

there is a focus on historically impacted energy communities. And while hydrogen offers the benefit of a potentially low-carbon, low-CO2 emissions future, it does come with other environmental and potentially social aspects that must be addressed in how it's used, in how it's made, and other factors.

And the last area is around technology adoption. And as Neva mentioned, it takes time for technologies to advance. Today's hydrogen technologies are primarily used in the U.S. in the Gulf Coast, around refineries, very specifically for those refineries' end use products. And those companies that have been producing hydrogen for many decades have a strong hands-on -- handle on how to safely produce and store and use it. But the fact is, they are using it within a relatively small range quantity and distance.

When we think about a potential for hydrogen across the energy economy, we have to think of it much like we think about today's electric infrastructure, or natural gas infrastructure, or petroleum more broadly, and that takes advancing a whole host of technologies and infrastructure that aren't yet at scale.

We've seen positive indications that we can get there through advancements and funding from the federal government, and Congress, and the Inflation Reduction Act, the Bipartisan Infrastructure Law, and the creation of a new infrastructure department within the Department of Energy that is looking to expand and commercialize these technologies faster. Certainly that will be a help. But it also will take the other two factors above. The communities, and the right mechanisms, and the right play to deploy hydrogen to see this module become even more critical to our energy economy.

When we think about hydrogen, we have studied it in a number of different ways. And this chart that you see here is based on an analysis of 2050 net-zero scenarios. Each of the three scenarios represents a different pathway to achieve net-zero emissions across the entire economy by 2050. And the first graph labeled 2020 is where hydrogen is produced and what the demand is today. Nearly all of it going to refining, or ammonia, or other nonenergy usage. All of it coming from natural gas, which the CO2 emissions are not abated. So high-carbon.

These three scenarios walk you through -- and

we could spend a whole day just on this economy-wide analysis. It is publicly available. But it essentially shows you that in scenario one, when we allow for carbon capture and sequestration to deploy across the economy, where the hydrogen could come pretrial and where could it go. And in scenario two, a higher price of natural gas. On average, about $6 per million BTU versus $3. The same for hydrogen. And then the last scenario is an option where we've restricted carbon capture and sequestration, we have restricted biofuels, and essentially shown where hydrogen might deploy in a very high scenario, but still low-carbon to reach net-zero.

And the impacts could be quite big. If we find ourselves in more of a scenario three, you can see the summaries that the impact would result in potentially large amounts of electricity demand to create that hydrogen, and a large portion of our electricity going to make it. And overall, we could see an increase of up to 10 times the amount of hydrogen than the U.S. produces per a day.

Now this is an economic analysis. It's built around many assumptions, all publicly available, but it does not include potential impacts from the

recently passed Inflation Reduction Act. And we can get into some specifics around that. But we believe that using these types of economy-wide models are helpful in providing deeper thought experiments around the potential role.

And you will see these types of analysis. We are not unique in these types of results. They are published by many others in the country who have different assumptions and different approaches, but this is one that highlights 2050.

When we apply --

CHAIRMAN FAY: Can I just interrupt you really quick?

MR. PREECE: Please.

CHAIRMAN FAY: I want to wait until the end, but just to your point, that footnote down there does not include the potential impacts of the Inflation Reduction Act, is that just essentially a cost adjustment for R&D and implementation?

MR. PREECE: It -- so the practical nature of not including it is we had already completed this analysis before the IRA was passed. We have since run other studies using the same model. And essentially what we have found is that the -- approximately the same amount of hydrogen still

deploys, but it deploys earlier than 2050.

So we don't see a significant increase in the amount of hydrogen that would be deployed across the economy because of the IRA. We actually see it deploy earlier in the timeframe. So essentially, hydro -- the tax incentives result in hydrogen becoming more of an economic option sooner because the IRA would be in effect in the early 2030s to the early 2040s.

CHAIRMAN FAY: So essentially, there is a federal subsidization, which then moves that up as to --

MR. PREECE: Correct.

CHAIRMAN FAY: -- to scalable at that point because of --

MR. PREECE: Assuming it could be salable, yes, the economics would point to that being the case.

CHAIRMAN FAY: Okay. Great. Thank you.

MR. PREECE: Yep.

To dig in a little bit more around hydrogen and some context around its use and the scale. Today, the U.S. produces about 10 million metric tons. And forgive all the different -- we are mixing a lot of different things, electric

kilowatts and metric tons for hydrogen. We tried to simplify it as much as possible. But the U.S. produces about 10 million metric tons. This data -- these data come from the U.S. Department of Energy's recently released hydrogen roadmap for the U.S., and you can see the breakdown.

And if we run-through a thought experiment that we convert all 10 of that million metric tons tomorrow and said it all came from electricity, that new electricity would represent 10 percent of the country's total generation in that annual basis. So 10 percent increase in electricity overnight for additional capacity -- additional generation needed to electrify hydrogen, 535 terawatt hours per year of electricity. It's a large amount.

The other aspect about hydrogen is its cost. Today it is not considered to be in parity with natural gas or other fossil based -- fossil fuel based fuels or electricity directly. But with the potential incentives from IRA and other mechanisms, it is certainly, as a lot of modeling is out there suggests, there is some potential in certain parts of the country that the parity, the cost between hydrogen and its use versus fossil fuels could

become closer to equivalent.

We've seen that for electrified hydrogen, there needs to be a robust increase in capacity. So manufacturing of these electrolyzers is still very small. And while we have the majority of our experience in hydrogen today coming from natural gas reforming.

The U.S., of course, the Department of Energy, has set a target of $1 per kilogram by the early 2030s. This analysis shows that with the IRA, specifically the 45V credits, there is a potential for certain parts of the country to achieve that target and potentially even get lower. That's, of course, based on a tax incentive, which is, as of today, a finite timeframe for implementation.

Three key things around cost of hydrogen that are really important to understanding, and this gets into the complexity around why looking at hydrogen from a levelized cost is -- can be tricky.

The first, of course, is it has a capital cost. To deploy hydrogen, you need to invest in new infrastructure from a production standpoint. So in this case, we are looking at electrolyzers, technologies that separate water into hydrogen and oxygen. The capital cost of those units, today we

estimate and have reports on about $2,800 per kW, per kilowatt. But if you look at the graph under capital cost, this shows you that there is a linear relationship between the cost of hydrogen on the Y axis and the capital cost of that unit, a fairly common relationship between an energy technology.

But the main cost for an electrolyzer producing hydrogen is the electricity input. So the electricity has a steeper curve associated with its impact of levelized costs. So the cheaper the electricity, the cheaper the hydrogen will be. It's an energy input to create that module.

And that would normally be a very nice easy what to represent the hydrogen economy, but electrolyzers have a very unique perspective in that they are a chemical engineering process, and so we also have to account for their capacity factor, and how they operate, and when they operate. And that does not always match up with low cost electricity.

So you can see the stronger relationship in the cost of hydrogen, what it takes to produce a kilogram of hydrogen, what it takes to produce a kilogram of hydrogen based on electricity for electrolyzers is more strongly influenced by that

capacity factor.

And so if we are to line up the capacity factor of renewables for, say, against their price, then it gets a little bit more difficult to understand and balance the true cost of hydrogen.

It's for that reason that we deploy a series of models and capabilities to investigate on a regional basis, not only the cost of the electrolyzer, the capital itself, but also where the electricity will come from and the associated cost of that electricity.

This chart shows us a breakdown of the potential cost of hydrogen based on the U.S. Inflation Reduction Act. The far left shows you the steam methane reformation cost. So taking natural gas today, generally around a dollar to $1.50 per kilogram, but that's not abated with carbon capture. If we add CCS, carbon capture and storage, and then apply the Inflation Reduction Act tax credits, so 45Q, or certain aspects of the IRA, then the cost including CCS is 90 percent capture in this case become equivalent with high carbon today. So there is a potential that with natural gas based technologies, we could achieve a lower carbon hydrogen at cost parity using tax

incentives.

The electrolyzer costs show a similar decline but a much bigger difference. So the first electrolysis graph shows you a range, a bigger range in cost. So we have assumed that in the 2030 to 2035 timeframe, the capital cost of an electrolyzer on average could be reduced to about $1,400 per kilowatt. Again, today, estimates that we have at this scale are nearly double that.

We have shown that the impact of that CAPEX cost, if it were to be half of what it is, 1,400, if it were around 700, what that would be, versus if it were double still at that 2,800 with and without the Inflation Reduction Act.

So again, this range, though, shows you across the entire U.S. We have looked at the generation profiles of wind and solar across all parts of the country, along with the cost of those resources that are deployed to generate hydrogen to get this range. So the state of Florida may not have the same cost, will likely not have the same cost to produce hydrogen as the state of Oklahoma or California, et cetera, because it is a complex evaluation of the electricity cost and the resource availability of that renewable profile. How much

will it operate? What is the capacity factor of that ensuing electrolyzer?

This is only the production cost. It doesn't get into the nuances of storing hydrogen. It's the smallest module out there, so it's very tricky to keep in place. It can be done. It's being done today in the Gulf Coast and other parts of the world. But when we think about it being used more broadly, as Neva mentioned, the infrastructure to deploy hydrogen will be a critical aspect of its potential deployment in a decarbonized scenario.

COMMISSIONER LA ROSA: Chairman?

MR. PREECE: Please.

COMMISSIONER LA ROSA: A quick question.

CHAIRMAN FAY: Commissioner La Rosa.

COMMISSIONER LA ROSA: So I just want to make sure I am understanding this correctly. So right now you are predicting -- or you are estimating that's about $2,800 per kilowatt, and this chart that you are showing, you are estimating, saying that it can get down to $1,400, right?

MR. PREECE: Potentially, yes.

COMMISSIONER LA ROSA: So -- and maybe you mentioned it. Maybe I missed it. What's in the way between that today? I know you mentioned it

was infrastructure, but then when you started to say -- I kind of maybe felt like maybe infrastructure was not a part of that --

MR. PREECE: No.

COMMISSIONER LA ROSA: -- or. Okay, so it sounds like it's not. So can you maybe kind of highlight a little bit of what's in between us getting to where we are today at $2,800 to the $1,400 -- to the 1,400 that you are demonstrating here?

MR. PREECE: Sure.

And I will clarify too, the 2,800 is based on a set of global engineering studies that we conducted. It could very much range, and certainly a volatile commodity these days, because there are a limited number of manufacturers. The projection, or the reason why we've assumed that the cost could be 50 percent, so that 1,400, would be purely economies of scale.

To produce an electrolyzer today, most manufacturers still have a lot of hands-on assembly of these components. So as they automate, as they increase the capacity of their production lines, as they reach bigger production capacities, we anticipate that those costs will fall, much like

we've seen them fall in solar panels, in batteries, and other technologies.

Electrolyzer has the benefits of being produced in a modular fashion. And electrolyzers have been on the market for more than 100 years. So a lot of the existing technologies that would underpin this transition to a hydrogen economy in the next decade will be based on the last century's worth of manufacturing, but automated and seeing an infusion of capital to get those systems, those manufacturing systems at larger scale.

We've certainly seen in the U.S. there has been a few announcements made by equipment manufacturers to bring what they call gigawatt scale manufacturing systems, which essentially means that they could make, in total, up to one gigawatt or more worth of electrolyzers into the system. So that number, that reduction is purely based on an assumption of reaching economies to scale.

COMMISSIONER LA ROSA: Chairman, quick question.

CHAIRMAN FAY: Yeah, go ahead.

COMMISSIONER LA ROSA: In your opinion, and I hate to even start a question with that, is that

industry -- because you mentioned capital, right, being invested -- is that industry reliant on government subsidies, or is that industry somewhat independent? I am trying to put a barometer, I guess, on that to better understand that market.

MR. PREECE: Yeah, that's a good question, and I don't know that I have a direct answer for you.

I would say it's maybe yet to be seen, because as the world was coming out of the impacts of the global pandemic, we saw that certain countries deployed economic mechanisms to adjust to the decline in their economy.

The European Commission, in response to not only the global pandemic, but also the war in Ukraine, recognized that relying on fossil fuels and also trying to invest in their economy through decarbonization was a means to enhance their economy, and they have put a lot of effort and a lot of focus and attention on hydrogen. And that has resulted in millions, if not billions, of dollars in investment to get these electrolyzer technologies specifically up to scale pretty soon.

Now, you have seen, of course, in the U.S. with the Bipartisan Infrastructure Law, the Inflation Reduction Act has also taken shape and

provided an even stronger incentive to produce low-carbon hydrogen. And then other parts of the world, China, India, South Korea, Japan, Australia, have also made very strong commitments to try and incentivize these production credits and certain market drivers that could lead to more demand.

We are not necessarily seeing a large investment from a government perspective globally, but, you know, there is this common saying around, you know, the chicken and the egg for hydrogen. It's the producers will increase their manufacturing if they have end users, and the end users will take hydrogen if they know the price, but all of those things are intertwined.

What we've seen with the Inflation Reduction Acts is the production side, in terms of price, has been fixed. We've established that there is a range that could be achieved with low-carbon hydrogen assuming production can scale.

The question still remains, and we've seen the U.S. Department of Energy's response to this this week, that there are questions if there are enough hydrogen off-takers, which is why point number one, in terms of the key aspect was, where will hydrogen play a role and who are those customers?

So I don't think we are there yet to understand are -- is the capital the a linchpin or really critical aspect to making hydrogen available? It probably is, but I don't -- wouldn't estimate that it's the limiting step at this point.

MS. ESPINOZA: You could -- you could look at the history with what happened with renewables to some extent, right, and so, you know, Jeffrey said it's yet to be seen, and it's absolutely true because these incentives are still brand new still, right? Although we feel like we have been talking about them for a long time, they are brand new.

When we saw the incentives with renewables, and that was in 2005, we didn't really see a step-up in build until, like, five, six years later, and then a decade to reduce capital costs by 80 percent, right?

So there is still a lot to do, and we are not just talking about building a technology and integrating it like we did maybe with solar, right? We just had to build the solar plants and integrate it to an established infrastructure, right? That's very different with hydrogen, because the infrastructure is not established.

So there is still, I think I would say, a lot

to learn on will it stand alone or not? It's going to be -- certainly, the timing will be accelerated because of the incentives that are being provided, as well as some of what the Department of Energy has done, for example, with hydrogen hubs, right? So really working on building localized economies in different parts of the United States that bring that whole value chain together that Jeffrey spoke of, producing, delivering, storing and using in smaller economies to really jump-start that market.

COMMISSIONER PASSIDOMO: Mr. Chairman?

CHAIRMAN FAY: Commissioner Passidomo.

COMMISSIONER PASSIDOMO: Thank you.

I have just a quick question. A lot of this seems to be very dependent on the manufacturing of the electrolyzers, so do we have any idea -- I know that there were incentives in those laws for domestic manufacturing, but are we -- do you expect that those are going to be on line in time for those these sort of -- well, for these kind of lofty goals to be in place?

MR. PREECE: Sure. So I think, again, it's a little bit yet to be seen, but based on the announcements that have been made, and the ribbon cuttings that have been held so far to date, it

seems that we are making progress in this country to provide the resources and the capital necessary to get the manufacturing to scale. The question -- the big question still remains, though, who will be the off-taker, and where will that be?

The interesting part about the incentives is it does reduce the production cost, but it doesn't necessarily provide an incentive for the end user other than the price. And so even if we reach parity, even if we reach lower cost on a fuel basis, we are not addressing with these incentives the cost to convert existing assets, which may have capital; training a workforce to accept that hydrogen and be comfortable around the safety aspects; addressing the other environmental or considerations such as water demand. You need clean water, very clean water, pure water, much like is made for power plant use today to produce hydrogen.

And so there has to be -- somebody has to start, and I think what we are seeing is movement in the right direction. And then eventually, you know, what we would -- anyone could probably, if we were to try to predict, there might be some S curve type adoption which tends to follow these types of

technology deployments. We've seen them in solar. We've seen it in wind. We are seeing it in batteries. It's potential, of course, that it could happen here with hydrogen and electrolyzers as well.

But the fact that we have some on-shoring, if you will, or some domestic now facilities that are looking to commission, or to begin operation and manufacturing, there is a potential that it could meet that incentive, and then, therefore, still -- there is still a little bit of time to figure out who those end users will be. And as Neva mentioned, the hydrogen hubs will certainly play a big role in that as well.

CHAIRMAN FAY: Commissioner Clark.

COMMISSIONER CLARK: Thank you, Mr. Chairman.

Just kind of a question, I was, by no means a scientist. I was a chemistry major for about six weeks and they got the good out of me on that one.

Explain to me the sources of hydrogen. We are talking about a significant amount of hydrogen. If we are going to get this to a scale where it is able to generate the needs, the electric needs of this entire country, that's a lot of hydrogen. And I don't assume that we are looking at total

replacement, but I certainly see some interest in moving that direction. But I guess I am more concerned about the other resources. And it's my understanding the sources are, we are going to electrify water, basically, and basically get rid of the water. We are going to change the water into hydrogen gas.

I am really curious about our water resources, and location of facilities in areas, how we are going to coordinate that transportation. And also the other sources of production, I assume the other one some sort of natural gas using -- being able to capture the hydrogen out of natural gas, leaving you, I assume, with nothing left but carbon to deal with in that perspective. And I guess the other one would be methane. Are there other sources of hydrogen that I am missing, not aware of?

MR. PREECE: So you are correct. The predominant form of hydrogen production today comes from natural gas in the U.S. And so we actually take methane, natural gas, and we use steam to separate the hydrogen from the methane to create hydrogen and carbon, CO2.

You can also use natural gas. There are developing technologies that are reaching

commercial scale around pyrolysis, which is taking hydrogen and converting it -- or taking methane and converting it into hydrogen and what we call solid carbon, or carbon black. So there is no CO2. It's a solid byproduct. And as I said, those technologies are evolving.

There are also, you know, direct means of the water components of taking water. It does require pure water, so you have to clean that water down to very high standards. And so where that water comes from is -- certainly will be a regional aspect of where hydrogen deploys.

Now, what the -- what our macro analysis of water demand in a hydrogen economy shows is that with a rebalance and a focus on water as a resource, it's possible that the amount of water withdrawn for the energy sector could stay the same or actually be reduced as we decarbonize, because a lot of waters withdrawn today in the power sector is for cooling towers once-through systems, and that water is returned back into the main body that it comes from, but there is a high level of consumption as well.

When we produce hydrogen from electrolyzers, on a site level, the majority of the water use is

actually in cooling the electrolyzer and not in splitting the water into hydrogen and oxygen.

So there is absolutely a demand for water that's associated with these electrolyzer technologies, but we still need to pay attention to the other aspects, including cooling, which tends to be something that a lot of folks ignore because it's, you know, not the thing that makes the money. So those aspects have to be considered.

There are also recent announcements that could potentially support naturally occurring hydrogen, and so we may find that in certain parts of the world, there could be reservoirs of hydrogen beneath the surface that could be extracted and used. And what that looks like is still very, very early in its development.

COMMISSIONER CLARK: That will probably be in Kenya or China, so we are going to have a problem again.

What about your -- do you have a direct formula for gallons per kW, or megawatt, or billions of gallons per megawatt produced, is there some sort of correlation we come to?

MR. PREECE: Sure. Yeah. I believe the number is about nine liters of clean water per

kilogram produced. But that's only the amount that you need to take water into the electrolyzer and make hydrogen. So that's the -- that's the water balance there.

COMMISSIONER CLARK: Okay.

MR. PREECE: For the site, it varies fairly drastically. We would be happy to follow up with our publicly available data that show you the water demands of certain designs.

COMMISSIONER CLARK: And my final question is, in the calculation of the cost to produce the hydrogen, are you counting the purification process --

MR. PREECE: Yes.

COMMISSIONER CLARK: -- of the water as well? That is part of your calculation? Okay.

MR. PREECE: Yeah. The only thing that's not included on a graph such as this one is the transportation, moving that hydrogen off-site in storage in and any end use. This is only taking either natural gas or water into the system and getting hydrogen coming right out of the gate.

COMMISSIONER CLARK: Thank you.

MR. PREECE: Sure.

COMMISSIONER LA ROSA: Chair?

CHAIRMAN FAY: Yeah, Commissioner La Rosa.

COMMISSIONER LA ROSA: So on the water topic, because that is -- that's a concern of mine as well, and with what you just mentioned, what about after the water is used, so it's not, you know, it's not there to split into hydrogen and used for cooling, or whatever it may be, is there a process where the water has to either be decontaminated, or sometimes water is so clean it can be -- it can be dangerous?

MR. PREECE: Sure.

COMMISSIONER LA ROSA: Is it there -- I mean, I guess, maybe walk me through in layman's terms of, you know, is that part of this process, and is that incorporated into the cost?

MR. PREECE: So the water that would be used for cooling is the same mechanism that we use in cooling applications today. Similar to power plants. Similar to industrial processes. Anywhere we use water for cooling, there is a natural cycling of whatever is in that water to begin with, so salts or, you know, other components would cycle up because we are evaporating water, and those solids and salts stay in the water, and we have to discharge. So those would likely follow the same

processes for regulation and evaluation from a water body impact that we have for any process today. So there is nothing unique about the cooling in the water use.

The water that goes into the electrifier is ultra pure. It's about the same quality that goes into a power plant today. Nearly all of that water that's purified goes directly in to be used. So there would be, essentially, no risk of any large-scale issues with that pure water being a source of an issue. It all gets used. It all gets converted into hydrogen molecules and oxygen molecules.

COMMISSIONER LA ROSA: Thank you.

MR. PREECE: Sure.

So switching gears into the second component around the regional aspects in the education. We are fortunate to have, in the U.S. and globally, but I have highlighted here the U.S. resources, a wealth of information already in the public domain.

It will be critical, as it is with any technology, no matter its form or source or function, that the public is educated and understands why we are talking about it; what we are talking about; how it impacts them. Around

hydrogen safety, it's typically the number one issue that gets raised around hydrogen, is it safe?

The fact is we already have, in this country and globally, standards and organizations at the national level, and likely at state levels, that handle the safe handling, production and use of hydrogen. Those codes, standards, guidelines, have to be reevaluated, some cases improved upon, because we are talking about using hydrogen in new ways, or at least larger volumes. But by and large, we believe that there exists a very strong, robust scientific and practiced community around hydrogen, and we've highlighted a few examples that could be referenced by the public.

Regarding where hydrogen plays a role., as I mentioned, we are not the only resource available to modeling and analysis. The Department of Energy, through the Inflation Reduction Act, is evaluating the use of the GREET model, looking at the greenhouse gas and other life cycle emissions aspects of hydrogen no matter what the production source is. That is an open source resource that is being evaluated by the Department of Energy and others.

And the National Renewable Energy Laboratory

also has many different tools, a few of them there ranging from the cost of hydrogen, to refueling, to storage and many other examples.

And specific to outreach and education, there are very hydrogen specific opportunities and resources available to a wide variety of offices, or stakeholders. Two offices I have highlighted, one within the Department of Energy, they call the Hydrogen IQ, releases a frequent on frequency webcast and seminars that are publicly available to dive into at an understandable level, at all levels to really understand what hydrogen is, where it's coming from and where it can be used.

And then, of course, we are seeing, associated with the use of federal funds from the Department of Energy and other areas, this need to focus on the administration's Justice40 initiative. And in that specifically is around how we can quantify and qualify the potential community benefits and impacts of a hydrogen economy.

Justice40, of course, is much broader than that, but there are specific components called out by the hydrogen hubs and recent funding opportunities from DOE that require the use of measures and tools and considerations associated

with environmental justice. So we thought it would be important to use this public forum to highlight there are many other publicly available resources available.

In terms of demonstrations, we have selected a few examples that we thought would be interesting to share, because as we've mentioned, hydrogen falls within a value chain. So we have to make it. We have to move it, store it and use it. And we've been fortunate to work and collaborate with many stakeholders on all different aspects.

The first around production is a project that we are working on with the U.S. Department of Energy and the National Renewable Energy Laboratory in Colorado at their facility which will operate a little over a one megawatt electrolyzer PEM's proton exchange membrane. It's a very flexible technology. It's still very new in commercial deployment.

And the core objective to is to understand the system characteristics and to create guidelines for the stakeholder community working with NREL and EPRI to develop these guidelines that can be used by any stakeholders in the hydrogen production space.

In storing and delivering hydrogen, we are participants in HyBlend, which is looking at today's, in the existing natural gas pipeline infrastructure, to investigate how we can use hydrogen in that infrastructure, in pipelines, in compression stations and other aspects, and quantify the benefits, the risks and the costs associated with it.

And lastly, we have been collaborating and part of many projects related to how hydrogen technologies could be adopted across the economy.

Again, hydrogen will play a role in some parts of the economy, more so in others, and regionally, it could -- it could vary from state to state, or area to area.

And so you can see a range representing transportation, both on-road and off-road, the power generation sector, small scale microgrid and large-scale central stations, as well as industrial heating and processing and other core aspects that are cross cutting industries such as leak detection sensors to monitor and measure hydrogen mitigation.

There is a lot of talk about blending, and so we thought it would be important to highlight a couple of critical aspects to it. It's certainly a

potential that parts of our economy could accept hydrogen blends in natural gas infrastructure. There are too many variables, in our opinion, to claim that a certain blend volume is applicable universally. You often see numbers ranging from five to 20 percent by volume as being something that could be suitable for many pipelines or end users.

We believe that a lot of nuance goes into that type of range and aren't necessarily supporting that that would be a value, or set of values that needs to be flagged or promoted. But rather, if we look at the role that hydrogen can play in blending at 20 percent by volume, a low amount, and in many applications, won't require a lot of changes to equipment. It doesn't produce -- or it doesn't result in the equivalent amount of CO2 reductions.

So a 20-percent by volume, we only achieve a seven-percent reduction in CO2 emissions, because hydrogen has about a third of the energy density by volume compared to natural gas. So we need a lot more volume of hydrogen to make the equivalent amount of energy, and that's going to become really important as we consider applications of hydrogen that acquire a lot of volume.

But if you take that 20 percent by volume, and, again, big picture kind of analysis to frame where we are today. If we assume that all of the U.S.'s natural gas consumption had that 20 percent by volume in -- which it cannot, but for the sake of creating some boundaries -- it would require 15 million metric tons of hydrogen. Today we produce 10 for the existing marketplace. It would require about 90 gigawatts of electricity capacity to produce that on an annual basis. Today, the world has about one gigawatt of capacity of electrolyzers. So the scale of what we are talking about is quite large.

Another end use application related to blending has been four recently completed large-scale commercial tests of hydrogen in power generation assets. So here we have linked for you the executive summary, white paper reports, and in one case a press release because data had not been released yet.

Unlike other demonstrations, you will find in our reports the emissions, data associated with CO2, with NOx and with carbon monoxide, along with a very detailed operating profile.

The maximum amount of time that was achieved

through hydrogen blending in any of these scenarios was five hours. We only operated at a maximum for these tests up to five hours of blending, driven by the availability of hydrogen. It takes a lot of hydrogen to blend what's still a relatively low percentage. But also we made -- there were no modifications made to any of the hardware on any of these assets. So we truly tried to test the in-the-ground installed commercial readiness of these technologies.

These tests have proven to be very valuable because they give us real data to quantify. In all cases, NOx emissions, for example, were managed and maintained with the existing permits without any additional environmental controls, technologies or changes to the environment, or any major modifications to hardware or software or operation profiles.

But these were only tests. They were short duration. They don't tell us, by far, everything we need to know to safely, comfortably, reliably operate on a hydrogen blend, certainly not on pure hydrogen, because that's a different game, in these existing assets, but really important first steps. It's the wide variety of sizes, of vintages, of

OEMs, and we are very fortunate to have worked with great collaborators that you can see listed here, and those manufacturers who made these projects possible.

We intend that there will be more of these projects. We have developed a robust research portfolio focused on hydrogen blending in power generation, looking at the different asset classes and the operations and control mechanisms. But we wanted to highlight that this is still very early stages of development, and more research is, in our opinion, is needed before we can get to larger commercial demonstration.

CHAIRMAN FAY: And, Mr. Preece, we are getting a little close on time. I was going to see -- I know you've got --

MR. PREECE: Sure.

CHAIRMAN FAY: -- this last part here, if you want to just sort of summarize that, and then I just wanted to make sure if my colleagues had any questions --

MR. PREECE: Absolutely.

CHAIRMAN FAY: -- we let them --

MR. PREECE: So what follows in the slides that I can summarize, because we've hit on every

topic, it was really just to dive into more specifics, is around what the scale of this blending could look like if it were across the entire country, and so I will get to the last one, where it has all the data associated.

So if we consider the potential for the existing gas turbine fleet to be evaluated for CO2 emissions reductions, we've used 160 gigawatts as a number, a placeholder. It has been used in our analysis of recently drafted regulations for greenhouse gas emissions from USEPA. And if we assume different blend rates, 30 and 96 percent, and a capacity factor on those gas turbines of 60 percent, what the equivalent demand of hydrogen would be. And you can see that these are very large numbers. Six million metric tons for that 160 gigawatts of fuel, where we produce 10 in the U.S. today, and 46 metric tons for a 96-percent blend.

That demand has an associated electricity need. It would result in approximately 96 percent of the amount of consumption from solar and wind and nuclear electricity today. So we don't yet have all the resources necessarily to make that hydrogen and use it reliably for a fuel in that

large of a gas fleet.

Likewise, if that hydrogen needed to be stored, much like we rely on natural gas, which is not a perfect example, because natural gas storage is generally based on seasonal demand, and we can't necessarily align hydrogen storage with natural gas practices. But current estimates out of the technology laboratory, a DOE lab, estimate less than 10 million metric tons of available hydrogen storage today.

So if we were to increase our hydrogen economy, it's likely, even with the power generation aspect alone, we would need to find alternate sources of underground hydrogen storage capabilities too, which is, because of economies of scale, likely to be the lowest form of hydrogen storage.

It's very difficult to store hydrogen as a gas in ambient conditions. And to store it in large volumes, generally in a liquified form, but it requires very, very low temperatures, a lot of energy, a lot of losses, and, therefore, a lot cost associated as well.

So to get the full energy economy together, we've identified, you know, what we think are core

aspects from a technology perspective, from an end user perspective and adoption. But certainly we are seeing a lot of positive momentum in terms of incentives, in terms of end user interest. And we feel like more can be done to increase stakeholder awareness on the potential for hydrogen.

CHAIRMAN FAY: Great. Thank you.

Commissioners, make sure if you had any follow -- I just have one -- one quick follow-up.

With renewables, there has obviously been a lot of conversation about the manufacturing, production of the panels, and the intertwining of, you know, international production and the reliance on that.

Is -- with the infrastructure required here, and the potential capital needed, is there a potential that we would run into a similar issue when we -- when we go to scale? And I am not -- I am not targeting one country in particular, but, I mean, I think there are some that have -- their goals are -- you know, to meet them, are going to require some innovation and use of hydrogen --

MR. PREECE: Yes.

CHAIRMAN FAY: -- and so then do we find of ourselves sort of relying on that?

MR. PREECE: So it's a complicated scenario, because much as -- most of the world is relying on solar and wind to decarbonized their electrification, because it is the lowest cost form of decarbonization today. We are seeing in countries, like, India has a goal to have more than 300 gigawatts of renewables on their system added in the next, I think less than 10 years. The U.S., in 2021, added less than 40, I think 32 or so gigawatts of solar and wind; in 2021, slightly higher, mid 30 gigawatts.

So we are talking about already a very high amount of demand on renewable wind and solar infrastructure globally. When you add hydrogen, it will potentially add to that demand, because, in many cases, such as the European Commission, they are -- have proposed, and likely to stand by, that the hydrogen produced for their decarbonization plan must come from a low-carbon source, mainly solar and wind. Nuclear, yet to be determined exactly. I think it has made it into the final -- the final writing for the regulation, but in terms of new resources that are added to meet the hydrogen demand, there -- we are watching closely and looking at what the potential for that wind and

solar will be on top of an already increasing trend to deploy those resources.

CHAIRMAN FAY: Great. Thank you.

Commissioners, anything else?

Seeing none. Once again, I just want to thank you for taking the time to be here. It's not uncommon for offices to have follow-up, so we will just make sure that all my colleagues have your -- both of your contacts if needed. And thank you again for making the trip.

We are going to move on to some other items in our agenda, so you are not required to hang out for those, unless you just want to, but I appreciate you time again. Thank you.

All right. Commissioners, next we are going to move into our Draft 2022 Report on the Status of Competition in the Telecommunication Industry. I will let our folks get set up real quick and provide us with a quick summary of that.

Mr. Wooten, you are recognized whenever you are ready.

MR. WOOTON: Chairman Fay, Commissioners, good morning still. Eric Wooten and Shelby Nave with IDM.

Item No. 2 is the draft of the 2023 Report on

the Status of Competition in the Telecommunications Industry.

The report shows that consistent with previous years, the wireline market continues to decline, but market shares remain relatively stable, and consumers continue to transition to wireless and business VOIP services.

The report must be submitted to the Legislature by August 1st, and staff is seeking your approval to do so, as well as administrative authority to make minor edits if needed.

Staff is available for questions.

CHAIRMAN FAY: Great. Thank you.

Any questions or comments from my colleagues?

Seeing none, we will just take a motion to accept the report allowing administrative authority just to fix any errors that might be in there.

COMMISSIONER CLARK: So moved, Mr. Chairman.

COMMISSIONER GRAHAM: Second.

CHAIRMAN FAY: Okay. Motion and a second.

All that approve say aye.

(Chorus of ayes.)

CHAIRMAN FAY: Showing none opposed, we approve the report.

Thank you, Mr. Wooten.

All right. Commissioners, next we will move into Item No. 3, briefing on the EPA's Proposed Rules Regarding Greenhouse Gas Standards and Guidelines for Fossil Fuel-Fired Power Plants. We will let our folks get set up for that item.

MR. HARDY: Good morning, Commissioners. I am Matthew Hardy with the IDM.

On May 11th, 2023, the U.S. Environmental Protection Agency proposed a rule consisting of five separate actions under Section 111 of the Clean Air Act to address greenhouse gas emissions from fossil fuel-fired electric generating units.

The proposed EPA rules would establish emission standards and the best system of emission reductions for large frequently used natural gas plants and existing coal units, as well as new natural gas plants and new, reconstructed or modified coal units. The proposal rule would also repeal the affordable clean energy rule currently in place.

Attachment 3 is the staff's summary of the EPA's proposed actions. The EPA is soliciting comments on the proposed rule, as well as other matters described in the summary. The current deadline for comment is August 8th, 2023.

Staff seeks Commission guidance on whether to submit comments to the EPA on the proposed rule. If the Commission desires, staff can bring draft comments to the August 1st Internal Affairs meeting for your review.

Staff is available to answer any questions.

CHAIRMAN FAY: Okay. Great. Thank you, Mr. Hardy.

I will go to my colleagues for any questions, but just real quick, as of right now, the August 8th appears to still be the deadline -- like, I know people file -- the different entities file for extensions for these types of things, that is the current date as far as we know at this time?

MR. HARDY: Yes, sir. That's still the current date.

CHAIRMAN FAY: Okay. Great.

Commissioners, any -- Commissioner Passidomo, you are recognized.

COMMISSIONER PASSIDOMO: Okay. Thank you, Mr. Chairman.

I would -- I don't -- I would like to get all of your opinions, but I think this would be -- I would want Florida to express their comments to the EPA. And I think going -- you know, we have -- we

are a unique state, and I -- you know, I have concerns about this adequate demonstration, the lack of a definition for that, and I don't know if it's been -- if our utilities in our state, the carbon capture tech -- sequestration and low greenhouse gas hydrogen has been, quote, adequately demonstrated in the state of Florida. So that might be one concern that I think we should express.

I think you all did a good job of laying out, you know, staff's potential concerns on, it looks like on page three. So, you know, if there is anything else that my colleagues want to add as well, but I -- I would definitely want to -- I think that it would be helpful for Florida to submit its comments to be brought up at the next Agenda and then go from there.

CHAIRMAN FAY: Okay. Great. Thank you.

And, Commissioner Passidomo, I know, as you mentioned, on page three, we've got some of the next steps and things that would be included in bringing forward some draft, and I think there is, for your point, even a footnote there that talks about that adequately demonstrated part.

Is there anyone in particular of those that

you would want to bring forward, or just making sure we address that issue in general?

COMMISSIONER PASSIDOMO: Yes, Mr. Chairman. I would think -- I just -- that -- that's just one that came out, you know, that was brought right to my attention. I went through the last -- you have it here -- the West Virginia case last May, and it seemed like this is the EPA's response to that Supreme Court case.

So I think, right now, that's -- this is -- one of their potential solutions, but I am concerned for our utilities, and if they have that capacity to have been able to demonstrate, you know, because I think we have to keep in mind that there might be a reliability issue if we are making these aggressive targets, and as well as not just reliability, but those cost concerns. I think if these -- this were to go through, we would have significant costs that would go through the environmental clause, and those are ratepayers that would be on the hook for those.

So I just think that -- I don't know how other states are set up, but our -- in the way that our vertically integrated system works, our ratepayers would be on the hook for a lot of these costs, and

so I think it's important for us to put our voice into the -- for the federal government to hear.

CHAIRMAN FAY: Great. Yeah, well said, and I agree with all of that.

Commissioner Clark.

COMMISSIONER CLARK: In general, I would say we just we oppose anything that EPA proposes. If you want to get specific and be a little bit more, probably careful about what you say, I do think we need to see some cost analysis, if there is any differentiation in opinion as to being opposed to all five of the areas that they specifically suggested here. I think we need to do a little bit of just rough cost analysis about what this would cost Florida consumers. I mean, in general terms. I am not saying we need an in-depth analysis, but we can assume that most of these changes in technology, as Commissioner Passidomo pointed out, which don't exist, successfully demonstrated carbon capture. That's a theoretical concept. But in order to be able to comply, it's going to cost Florida consumers money. And I am generally opposed to anything that's going to add any additional burden from an environmental perspective on them at this time.

So I fully support sending in a letter of opposition, Mr. Chairman.

CHAIRMAN FAY: Okay. Great. Thank you, Commissioner Clark.

Commissioner La Rosa.

COMMISSIONER LA ROSA: Thank you, Chairman.

I agree. Well said by both. Thank you. I think all four of the concerns that staff has laid out are all very valid concerns. All should be laid out in our comment back to the EPA.

To maybe take it a step further, I think that the results of what the current environment looks like would be an important element for, frankly, for ratepayers to understand. At the end of the day, it's going to end in additional costs. But the reason why it's ending in additional costs is because it could require us to take action that maybe wouldn't be necessarily taken if we were considering everything that we typically look at.

These new regulations are going to really tie our hands. I think now is the time to pushback as much as we can, and at the same time, I think consumers need to be made aware of it, because then what ends up happening is that they come back to us when we make decisions, but yet don't understand

100 percent of why that decision was made.

Well, this is the reason why some of the decisions that are make were made, and I think now is the time to paint that picture and make sure consumers understand that if these regulations were to go into effect, at the end of the day, that could result in maybe abandoning a good reliable sources of energy that maybe haven't met their ultimately time of extinction or time of service.

So I think that needs to be a part of that, is that cost is extremely important, and now would be a very, very, very difficult time to put these costs on consumers, because I think that -- I think what the industry needs is predictability and efficiency. And without that, they are going to have to start to make -- start taking these steps forward now, and I think that would just be harmful to all of our customers.

CHAIRMAN FAY: Great. Yeah, and I mean, I share a lot of those thoughts. Sometimes, when we see these mandates, it's very concerning when there is so many entities that can manufacture the technology that provides -- to meet the mandates, and then essentially, there is -- you find that you are somewhat held hostage of those costs because

there is only so many people that do it. And to Commissioner La Rosa's point, that eventually, you know, impacts the cost to customers.

And I think this is one of those things where, as you pointed out, it might be early, I mean, this -- there might be along ways to go. And I think depending on what's going on in DC, this has shifted back and forth as to what the requirements are, but during that time, we have seen Florida continuously make adjustments based on what customers, and what they believe is appropriate. So to implement these mandates could really impact costs.

So I think if we, Mr. Hardy and Mr. Rubottom, if we move forward with those four components that have been pointed out in this analysis, but then also to Commissioner Clark's point, is there an appropriate method of some cost analysis that maybe we could do on the front end to point out how Florida would be impacted? And it might be appropriate to defer to DEP or to the utilities. I don't know if any of those entities are filing their own comments, but is that something we could, I guess, work with them, or look at? And then if it's within our purview, we could include it in our

comments, and if not, then maybe would be included otherwise?

So I hear Mr. Baez clinging his button over there, so we will go to you, Mr. Baez, an then --

MR. BAEZ: I'm -- while I think the will of the Commission is worthy, and I think had we had -- had we the information that I think might be necessary in order to actually come up with a number that certainly I would be comfortable -- this is just my opinion -- that I would be comfortable with you all being comfortable with, if that makes sense. I just don't know if we have the information. We would have to look.

That said, there may be some back-of-the-envelope that might be appropriate, and existing information available to be able to mock up, but it's always going to be a mock number, you know, heavily assumed.

COMMISSIONER CLARK: And I would just add to that. I think Commissioner La Rosa was kind of narrowing down for me what I was saying a minute ago. Thank you.

You know, just look at the, for an example, the number of generating units out there that would have to be replaced automatically that don't meet

these requirements. There is a black-of-the-napkin cost calculation.

MR. BAEZ: Yeah. Yeah. There is a number like that. I guess my concern is how official that number becomes on behalf of the state commission, but that's just -- that's just a me thing.

COMMISSIONER CLARK: Round up then.

MR. BAEZ: I think we can do something.

CHAIRMAN FAY: Okay. Great. And then maybe, Commissioner -- Mr. Baez, I almost called you Commissioner Baez there. I apologize.

MR. BAEZ: It happens.

CHAIRMAN FAY: Yeah. I think maybe then we would take that information and it could satisfy some of what the Commission wants to look at, but not necessarily, depending on how we get to those numbers, be included in the final submission. It would just depend on the relevance.

MR. BAEZ: Yeah. We will figure out a way to couch it as what we want it to be --

CHAIRMAN FAY: Yeah. I think --

MR. BAEZ: -- using the word the back-of-the-envelope, but I think I get where Commissioner Clark is coming from, and I am there.

CHAIRMAN FAY: Okay. Great.

MR. BAEZ: Thank you.

CHAIRMAN FAY: Sure.

Anything else? Sorry, Mr. Rubottom, good? Okay.

All right. Commissioners, with that, then we would be moving forward with the -- as far as the next steps go, we have got four components in there. I think specifically number three, that Commissioner Passidomo mentioned, might need a little bit more detail as to that analysis, and then some form of cost components that would be included in this. And then the Commission could weigh that at the August 1st meeting and determine the appropriate submission at that time and still meet the August 8th deadline. So if that's sufficient for staffer to move forward on comments, then we would support that.

Mark, do we need a motion to do that, or is the direction sufficient at this time? Because as long as we are not submitting a document, I don't think we need to go ahead and formally approve that.

MR. FUTRELL: No. I think it's apparent the will of Commission is clear.

CHAIRMAN FAY: Okay.

MR. FUTRELL: I think we got what we need. Thank you.

CHAIRMAN FAY: Great. Thank you.

All right. Well, that addresses Item No. 3. With that, we will move to Item No. 4, General Counsel's report.

MR. HETRICK: Good afternoon, Mr. Chair and Commissioners. I have no report, Mr. Chair.

CHAIRMAN FAY: Okay. Great, Mr. Hetrick.

Mr. Baez, Executive Director's report.

MR. BAEZ: Mr. Chairman, we just want -- Lance Watson is here just to give you a quick roundup of the legi-- the wrapup of the legislative passages. That's terrible. See, my English.

CHAIRMAN FAY: Yeah, so Lance can take it from here.

MR. BAEZ: Go Lance.

CHAIRMAN FAY: Okay. You are recognized.

MR. WATSON: Good afternoon, Chairman and Commissioners. Thank y'all.

The Florida Legislature concluded the 2023 legislative session May 5th, 2023. During the session, the PSC's Legislative Affairs Team monitored, tracked 42 bills of the 1,828 general bills and local bills filed. Of those bills,

approximately 356 passed both chambers of the Legislature. And of those that passed, the Governor approved all but seven, which were ultimately vetoed.

I will go through real quick just a couple key bills that passed that do impact the PSC. You all should have received this wrapup via email on Friday, July 7th.

The first one being House Bill 125, which we have called the Fair Market Value Bill, that did pass and was approved by the Governor on June 26th, with an effective date of July 1.

The next one being House Bill 1221. That's the Broadband Internet Service Providers Bill. You may recall that this bill specifies that poles of rural electric co-ops that provide broadband service are subject to PSC regulation and allow the PSC to access those books and records. That was -- that did pass, and was approved by the Governor on June 5th.

And lastly, local bill House Bill 1645, City of Gainesville, Alachua County, that bill creates the GRU, the Gainesville Regional Utilities Authority. The Governor signed that on June 28th, and also had an effective date of July 1.

Really, the only bill of interest that did not pass was Senate Bill 1162 and House Bill 821, which is the Renewable Energy Cost Recovery Bill. I would expect that we will see that again. We've heard that the Speaker is interested in a more robust energy package, and they seem to believe that will be a part of it with this upcoming session, so I would be on the lookout for that.

And lastly, just some brief budget info. In total, the budget totaled 117 billion, putting Florida's reserves at 10.9 billion. The overall budget includes a five-percent pay raise for State employees, as well as agency discretion pay increase plans to address compression, recruitment and retentions.

The retirement system saw the following enhance benefits: Retiree health insurance subsidies increased to $75 per month. The DROP Program has an extension from eight to 10 -- from five to eight years, and eight to 10 years for teachers. The special risk category sees a reduced normal retirement for to 55, or 25 years of service. And the investment plan has a two-percent increase to employer contributions.

As it relates to the PSC the -- our budget was

fully funded at $28,903,778 and 272 positions.

Other than that, we are gearing up for committee weeks for 2024, which are set to begin the third week of September, with an early session beginning January 9th.

And I will kick it back to Director Baez for anything I left out, and we are happy to answer any questions.

CHAIRMAN FAY: Great. Yeah, let me just make sure before you go to Director Baez, Commissioners, any questions on the presentation of the -- and that essentially was a continuation budget that we put forward?

MR. WATSON: Yes.

CHAIRMAN FAY: Okay. Great. Yeah.

MR. BAEZ: I think it had a slight reduction and got trued up with all the other general budget matters.

CHAIRMAN FAY: Okay. Anything else? Go ahead.

MR. BAEZ: I also will mention, and just to keep Mary Anne Helton happy, the Bar dues were provided for again this year, so the legend grows.

Unless you have any questions, that's it.

CHAIRMAN FAY: Okay. Great. Thank you.

That will conclude the Executive Director's report.

Commissioners, any other matters at this time that you want to bring before the Commission as it relates to the Internal Affairs?

Seeing none, this meeting is adjourned. Thank you all.

(Proceedings concluded.)

CERTIFICATE OF REPORTER

STATE OF FLORIDA)
COUNTY OF LEON)

I, DEBRA KRICK, Court Reporter, do hereby certify that the foregoing proceeding was heard at the time and place herein stated.

IT IS FURTHER CERTIFIED that I stenographically reported the said proceedings; that the same has been transcribed under my direct supervision; and that this transcript constitutes a true transcription of my notes of said proceedings.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorney or counsel connected with the action, nor am I financially interested in the action.

DATED this 24th day of July, 2023.

DEBRA R. KRICK
NOTARY PUBLIC
COMMISSION #HH31926
EXPIRES AUGUST 13, 2024