

2022 INTEGRATED RESOURCE PLAN

EXECUTIVE SUMMARY



VERMONT CO
ELECTRIC OP



A LETTER FROM OUR CEO

We are pleased to file this Integrated Resource Plan with the Public Utility Commission. In these unprecedented times, our energy world is changing rapidly. This look at our future starts with identifying our questions and challenges. Our team recognizes that meeting these challenges will be hard, and we are engaged, excited and eager to craft VEC's role in mitigating the impacts of climate change while also meeting our foundational mission of safe, reliable, and affordable energy services. Our biggest challenge is how we meet all these goals simultaneously, in a way that meets members' needs and equitably supports our rural communities.

Even as we look to the future, we remain conscious of the present and describe the action we are taking today to best serve members. Our goal is to make plans and act in accordance with those plans, focusing on results, while remaining curious, nimble, and adaptable to constantly changing circumstances.

We face an uncertain pathway – we know we are headed to a clean energy future but unsure exactly how we will get there. At VEC we have an excellent team, an array of great partners and many innovative initiatives underway as detailed in this plan. As we head down this energy path together, we anticipate the opportunity for significant problem solving, creativity and ultimately outcomes that will define our energy ecosystem in Vermont and beyond. We look forward to your questions and feedback on this plan, as well as your suggestions as to how we can work together to serve our members today and achieve our energy future.

SINCERELY,



REBECCA TOWNE

Chief Executive Officer



INTRODUCTION

VEC's mission is to serve our Cooperative members with safe, reliable, and affordable energy services.

This Integrated Resource Plan (IRP) plan presents a continued path to ensuring excellence, balance and flexibility. We file this plan every three years with our regulators and engage energy stakeholders throughout the process. Appendix B: Guidance for Integrated Resource Plans and 202(f) Determination Requests lays out the baseline requirements for our IRP and IRP's are required to be consistent with the Comprehensive Energy Plan (CEP). In addition to those requirements, our IRP answers the following questions:

- a. What are the potential costs of getting to 100% Carbon Free by 2023 and 100% Renewable by 2030 power portfolio on an annual basis?
- b. How can we start to anticipate the incremental costs and challenges of serving VEC's 2030 load with a 100% Renewable energy on an hourly basis (24/7)?
- c. What can we do to enable distributed generation and promote affordable renewables?
- d. What does the hourly controlled and uncontrolled load shape look like with Cold Climate Heat Pump (CCHP) and Electric Vehicle (EV) growth in 2025, 2030, 2035 and 2040? What are the challenges associated with those?
- e. What role does load management play in keeping rates low and preventing system upgrades?
- f. Can the grid support the additional load growth?
- g. How many additional megawatts (MW) of battery storage can be installed state-wide before VEC's current utility-size battery strategy is uneconomic moving forward?
- h. How are we meeting our Energy Transformation goals today and tomorrow?
 - i. How do we enable just and fair membership participation in the energy transition?
 - j. What can we do to support low income members?
- k. How are we maintaining reliability amid climate impacts?
 - l. What are we doing to prioritize cybersecurity efforts?
- m. What does resiliency look like for VEC?
 - n. How do we innovate to meet this challenge?
 - o. How do we leverage technology in the grid of the future?
- p. What do we do to keep our staff and members safe in this new complex electrical grid?
- q. How will we develop our staff, retain, and attract talent?
- r. What is VEC's role in the energy services sector?

We've been working with the Department of Public Service who has provided input on our plan draft, and will submit this to the Public Utility Commission, where it will have the opportunity for public input. This IRP does not lay out our plan for achieving 100% renewable energy, and our answers to many of the above questions will take further analysis and time to resolve. However, this plan provides background analysis on how we will make some of those decisions

As our electrical systems become more complex, it requires us to be increasingly thoughtful about our investments. Our goal is to be prepared to execute the plans set forth in this document, while remaining nimble and adaptable to a changing future. While this future may bring uncertainty, it also brings an unlimited number of opportunities to meet members' increasing expectations.

THE FIVE CHALLENGES WE FACE AND OUR STRATEGY

1. DECARBONIZING THE ENERGY ECOSYSTEM

Develop a diverse, affordable, and reliable 100% renewable portfolio roadmap and make smart investments to expand energy transformation

2. JUST TRANSITIONS AND ENERGY EQUITY

Support rural and members with high energy burdens to enable membership-wide participation in the energy transition

3. MAINTAINING A RELIABLE ELECTRIC GRID

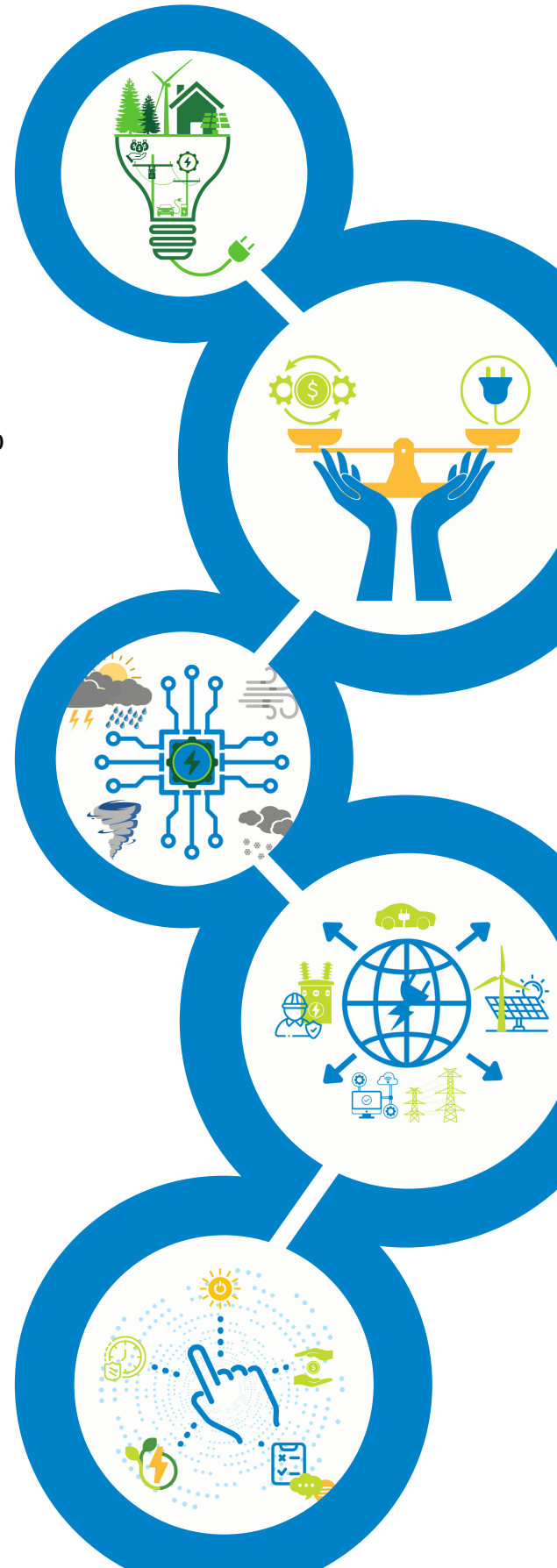
Invest in infrastructure upgrades and resiliency

4. SUPPORTING A RAPIDLY SHIFTING CENTRALIZED & DECENTRALIZED GRID

Develop an innovation farm where ideas grow and flourish, attract and develop excellent talent, and build a complementary technology road map

5. PROVIDING MEMBERS WITH CHOICE

Expand VEC's role in the energy services sector to meet individual and membership wide needs with comprehensive energy options



DECARBONIZING THE ENERGY ECOSYSTEM

100% RENEWABLE BY 2030

- Develop a diverse, reliable and affordable renewable portfolio roadmap
- Further integrate power supply, engineering and operations efforts
- Educate and collaborate with regulators and energy stakeholders
- Leverage regional hydro and wind, local biomass and solar
- Procure affordable, reliable, and renewable baseload power sources to get us through intermittent generation periods

SMART INVESTMENTS TO EXPAND ENERGY TRANSFORMATION

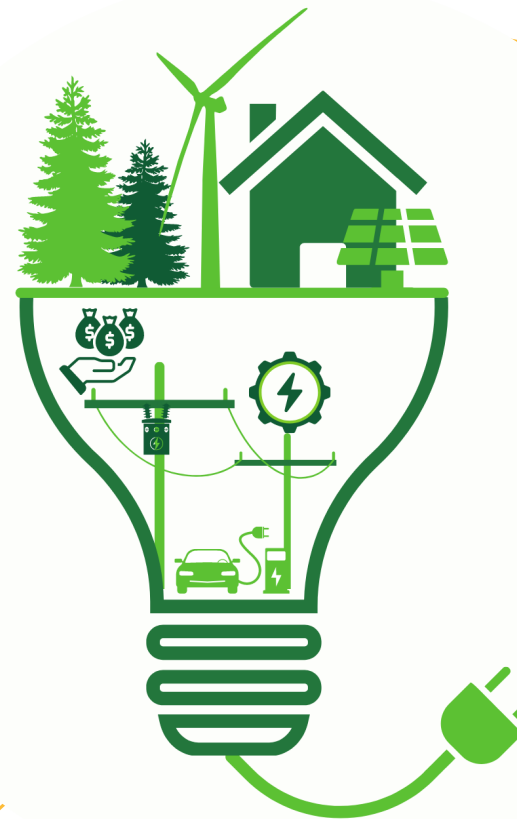
- Expand partnerships with Efficiency Vermont, private sector and other Vermont utilities
- Educate communities on heating and transportation options and apply for grants

INVEST IN INFRASTRUCTURE FOR ELECTRIFICATION

- Replace #6 Steel and 8D Amerdutor wire by 2030
- Upgrade single phase lines
- Promote free transformer and service upgrades for electrification
- Mitigate supply chain constraints

ENABLE DISTRIBUTED GENERATION

- Support SHEI grid constraint mitigation, including system upgrades
- Enhance the interconnection process through data transparency and new technology



JUST TRANSITIONS AND ENERGY EQUITY

KEEP RATES LOW

- Pilot and implement cost effective load management programs to reduce transmission costs
- Support economic development strategies to attract people and industries to northern VT
- Consistently achieve financial goals to maintain stability, keep borrowing rates low, and obtain least-cost power supply contracts
- Seek grants to supplement VEC investment

ENABLE MEMBERSHIP-WIDE PARTICIPATION IN THE ENERGY TRANSITION

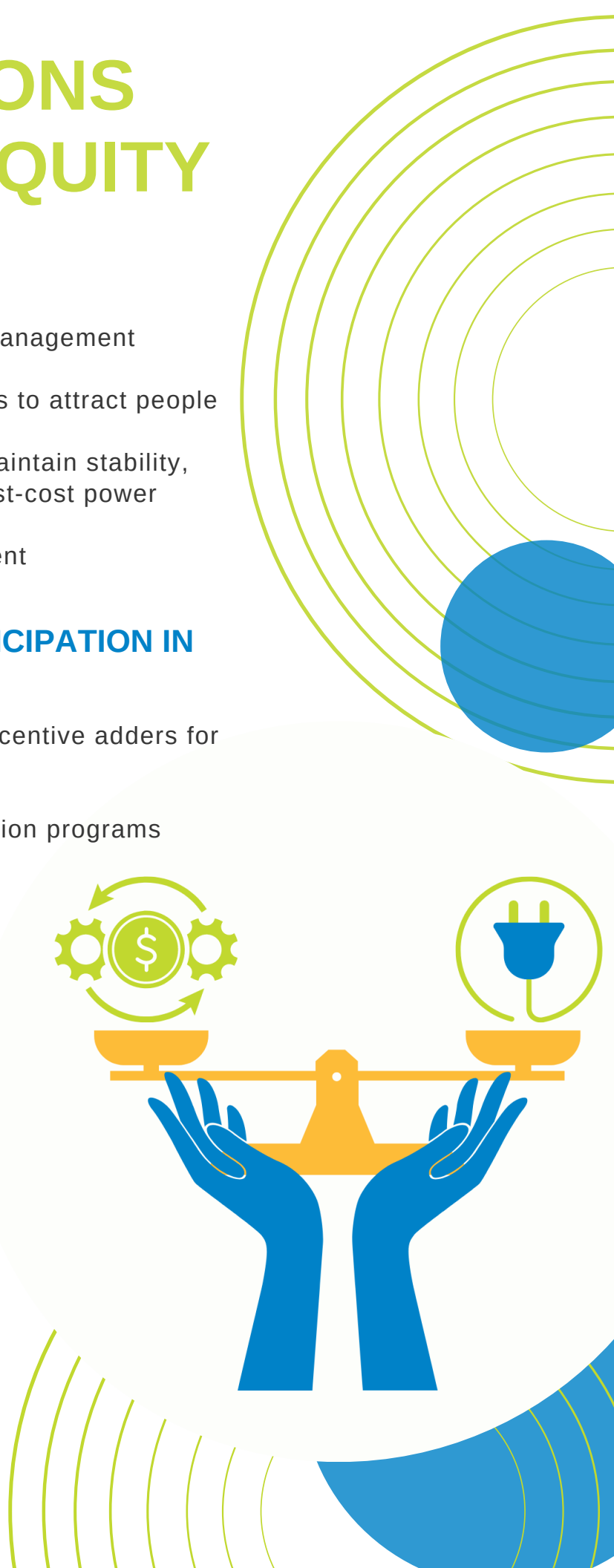
- Promote Low and Middle Income (LMI) incentive adders for electric vehicles and heat pumps
- Implement on bill financing pilot projects
- Seek energy equity in energy transformation programs through eligibility and incentive design

FOCUSING ON LMI MEMBERS

- Promote arrearage assistance funded programs
- Implement rural and high energy burden pilot projects
- Advocate for energy equity

PROMOTE AFFORDABLE RENEWABLES

- Develop an affordable and reliable renewable portfolio roadmap
- Educate communities and energy stakeholders on energy issues
- Develop new strategies to boost Community Solar participation



MAINTAINING A RELIABLE ELECTRIC GRID

MAINTAIN RELIABILITY

- Continue systemwide Maintenance Plan and condition-based assessments/replacements
- Explore satellite imagery Vegetation Management strategies and use of drones
- Expand outage management technologies and strategies for faster restoration

INVEST IN RESILIENCY AMID CLIMATE IMPACTS

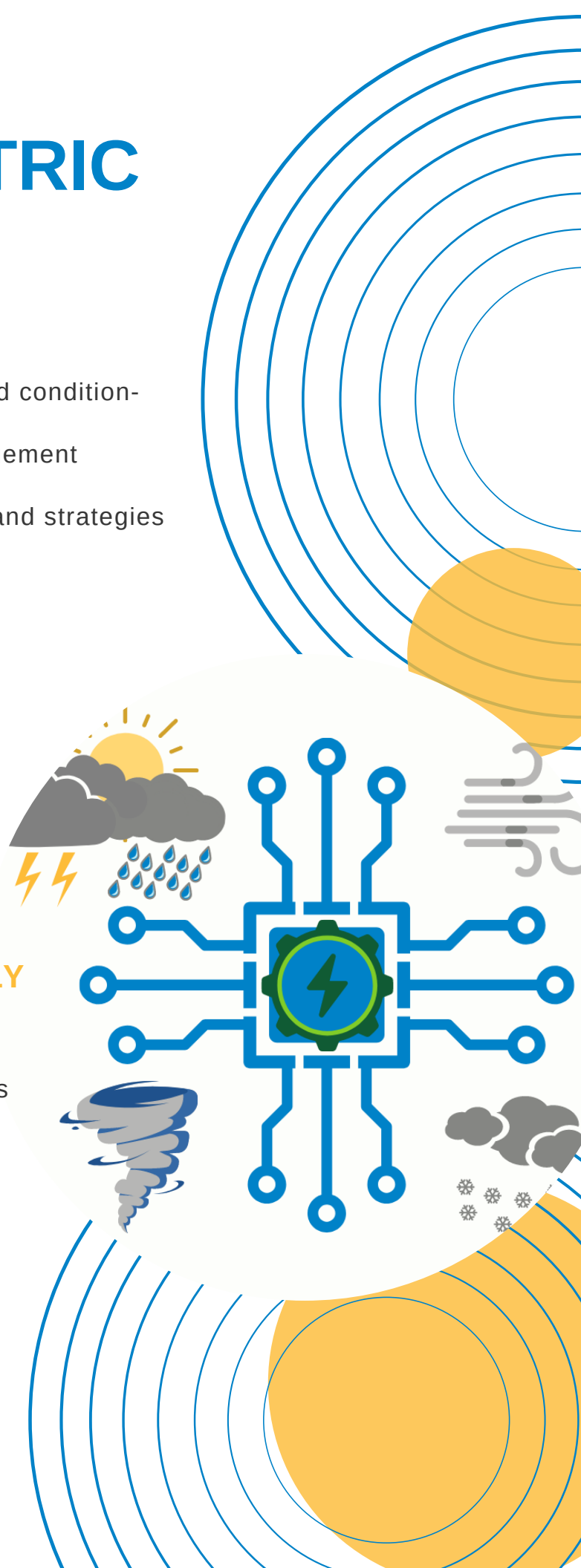
- Invest in strategic line relocations and undergrounding
- Explore resiliency as a service with home battery and backup generator penetrations across the territory
- Educate, determine funding, and implement Microgrid pilots
- Expand feeder backup

PREPARE FOR TRANSMISSION SUPPLY CONSTRAINTS

- Implement Vermont Utilities Winter Preparedness Task Force recommendations
- Expand our capacity to connect to Hydro Quebec during emergencies
- Support cost-effective transmission level storage

PRIORITIZE CYBERSECURITY EFFORTS

- Dedicate resources to threat detection and management
- Ensure KPI's and national compliance are met
- Adhere to industry wide best practices and companywide training



SUPPORTING A RAPIDLY SHIFTING CENTRALIZED & DECENTRALIZED GRID

BUILD A CULTURE OF INNOVATION AND LEARNING

- Develop an innovation strategy and establish our Innovation Farm where ideas grow and flourish
- Expand strategic partnerships with rural cooperatives and expand participation national organizations

DEVELOP TECHNOLOGY STRATEGY ROADMAP

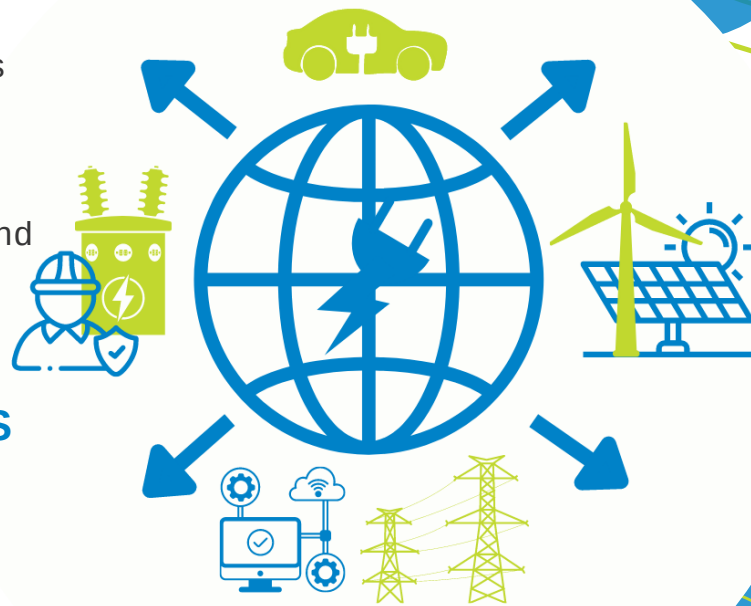
- Empower staff with technology that enhances collaboration and enables new insights
- Research and implement next generation metering data platform
- Integrate and orchestrate operational tools and resources to ensure reliability on the distribution system

KEEP OUR STAFF AND OUR MEMBERS SAFE

- Continue global improvements to VEC's safety program
- Ensure compliance with standards

DEVELOP AND RETAIN GREAT TALENT

- Train employees and provide them with broad experiences
- Create a working environment that is flexible, rewarding, and stimulating
- Pursue diversity and inclusion at all levels of the organization



PROVIDING MEMBERS WITH CHOICE

EXPLORE VEC'S ROLE IN THE ENERGY SERVICES SECTOR

- Pilot innovate rate designs and incentives to support economic development, member choice and convenience
- Promote adoption of load management programs

ENHANCE MEMBER INTERACTIONS

- Continue to develop communication options for members, particularly leveraging technology
- Improve member interaction through SmartHub, outage information and proactive communication

MEMBER FACING DATA

- Consistently seek understanding of members wants and needs
- Develop and implement new C&I offerings to increase visibility of usage and peak impacts
- Ensure member data privacy while providing proactive, actionable data

