How to identify gaps in the current standards?

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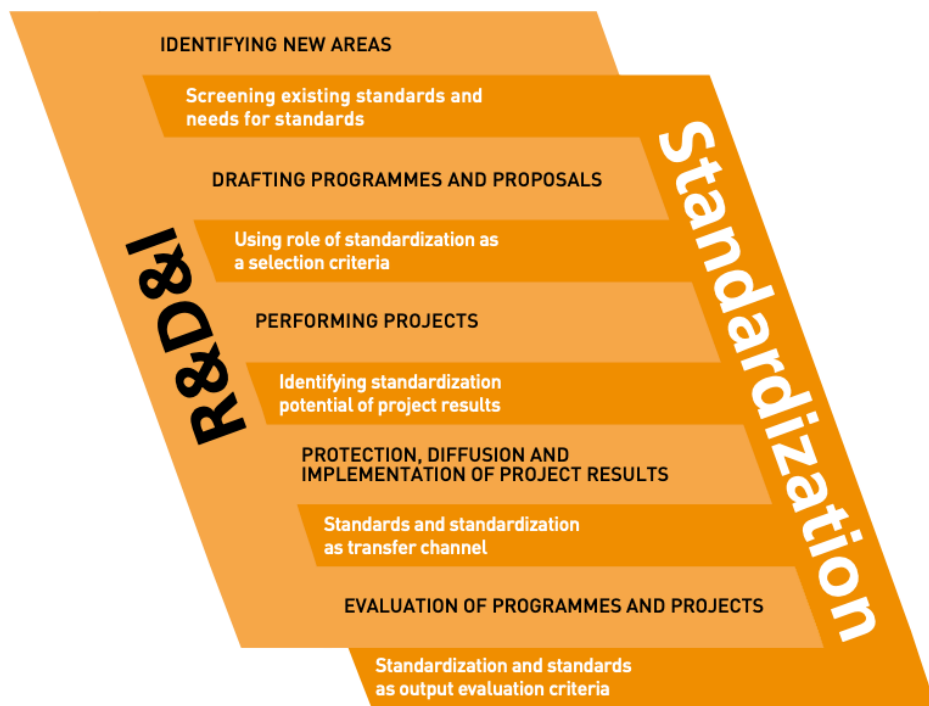
Why do researcher need standards?

Beyond Publications and Patents:	Standards disseminate knowledge and represent the cutting-edge in science, technology, and various methodologies.
Utilizing Funded Research:	Incorporating intellectual property from funded research into standards to enhance utility and adoption.
Practical Application Enhancement:	Optimizing the real-world usability of research findings.
Knowledge and Product Commercialization:	Transforming research and technological insights into commercially successful products and services.
Wider Dissemination and Use:	Broadening the reach and practical use of research discoveries.
Building Prestige:	Elevating stature and acknowledgment within the academic and professional communities.
Fostering Collaborative Networks:	Connecting with peers, industry experts, and stakeholders to spark future research and innovative ventures.
Inclusive Rule-Making:	Ensuring that the development of regulations for future research involves all relevant participants.

STAIR: Standardisation, Innovation and Research

IDENTIFYING NEW AREAS

Screening existing standards and needs for standards

DRAFTING PROGRAMMES AND PROPOSALS

Using role of standardization as a selection criteria

PERFORMING PROJECTS

Identifying standardization potential of project results

PROTECTION, DIFFUSION AND IMPLEMENTATION OF PROJECT RESULTS

Standards and standardization as transfer channel

EVALUATION OF PROGRAMMES AND PROJECTS

Standardization and standards as output evaluation criteria

R&D&I

Standardization

What are your needs?	What can standardization contribute?	What should you include in your R&I project?
Have a starting point for your project	Standards are state of the art for industrial and societal practices	A task related to screening of existing standards
Ensure methodological robustness	Ensure compatibility of your results with what is already on the market	
Improve the quality of your project's activities and outcomes		A standardization parner or subcontrator
	Comply with recognized test methods, health and safety requirements	
Ensure broad applicability of your project results		
Increase the impact of your project	Give you access to discuss and promote your project outcomes with stakeholders and potential customers	Task(s) aimed at contributing to new standards
Long term dissemination of your results	Disseminate your results to a relevant range of European or world-wide stakeholders	
Ensure market acceptance of your project results	Ensure that your project results are known and used by the market well beyond the duration of your project	A standardization partner or subcontractor

- CEN/CENELEC (2011). STAIR: an integrated approach for standardisation, innovation and research. Accessed on 15.12.2023. Retrieved from: https://www.iso.org/sites/edumaterials/STAIR.pdf
- HS Booster. (2023). Why Do Researchers Need Standards. Accessed on 15.12.2023. Retrieved from: https://hsbooster.eu/sites/default/files/2023-06/B1%2001%20WHY%20DO%20RESEARCHERS%20NEED%20STANDARDS.pdf

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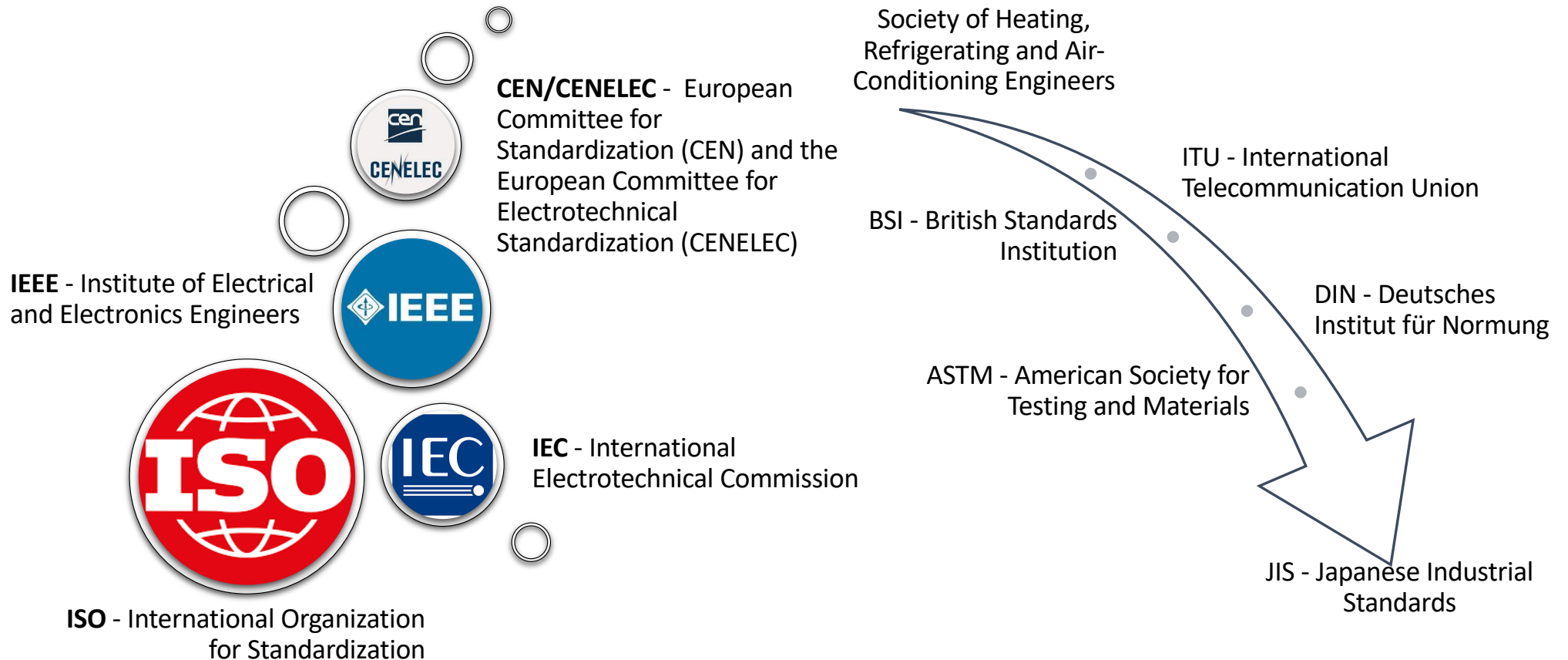**1. Comprehensive Literature Review:**

- **Historical Context**: Understand the historical development of the standard. Changes in standards often reflect advancements in technology or shifts in consumer demand and safety requirements.
- **Comparative Analysis**: Compare the standard with others in similar domains to see if there might be elements that are more advanced or comprehensive elsewhere.
- **Academic and Technical Publications**: Regularly review academic journals, technical reports, and conference proceedings to stay informed about the latest research findings that may point to limitations in current standards.
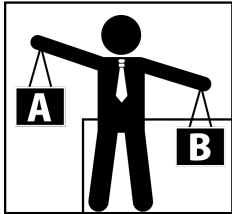
1. Comprehensive Literature Review:

- **Innovation Scan**: Systematically scan for new innovations and technologies that are not yet covered by existing standards. This includes reviewing patents, attending industry conferences, and participating in technical forums.
- **Technology Adoption**: Assess the rate of adoption for certain technologies and whether standards are keeping up with the rate of change.

4

Comprehensive Literature Review:

CEN/CENELEC - European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC)

IEEE - Institute of Electrical and Electronics Engineers

IEC - International Electrotechnical Commission

ISO - International Organization for Standardization

ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers

ITU - International Telecommunication Union

BSI - British Standards Institution

DIN - Deutsches Institut für Normung

ASTM - American Society for Testing and Materials

JIS - Japanese Industrial Standards

How to identify gaps in current standards?

2. Survey and comparative analysis

- **Surveys and Interviews**: Conduct surveys or interviews with various stakeholders, such as product manufacturers, service providers, and consumers, to gather qualitative data on the effectiveness of current standards.
- **Cross-Disciplinary Review**: Sometimes, standards from one discipline can inform gaps in another. For instance, advancements in software standards could inform hardware standards and vice versa.
- **Global vs. Local Dynamics**: Consider the impact of globalization. Some standards may not fully consider local environmental conditions, cultural aspects, or economic factors.

3. Pilot projects
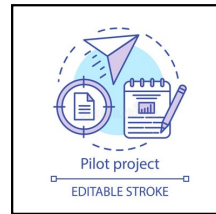
Pilot project
EDITABLE STROKE

- **Pilot Studies**: Conduct or review pilot studies where the standards have been applied to novel situations or technologies.
- **Real-World Testing:** Pilot projects expose new technologies to actual conditions, revealing practical issues and performance limitations, indicating where current standards may be insufficient.
- **Diverse Feedback:** Involving stakeholders in pilot projects gathers varied insights, identifying unforeseen problems and user needs that may not be addressed by existing standards.

How to identify gaps in current standards?

4. Policy and Regulations:

• **Setting the Baseline for Standards**: Policies and regulations often establish the fundamental requirements and baseline for standards.

• **Driving Innovation and Updates in Standards:** Regulatory changes can prompt the revision or creation of new standards. When regulations evolve due to technological advancements, environmental concerns, or shifts in societal values, standards must also be updated to stay relevant and effective, driving innovation in standardization.

5. Socioeconomic Impacts

• **Alignment with Sustainable Development Goals (SDGs)**: The United Nations' SDGs set global priorities like environmental sustainability, and equitable growth. Standards must evolve to align with these goals, promoting practices and technologies that contribute to sustainable development across various sectors.

• **Consumer Behaviour and Expectations:** Changes in consumer preferences, such as a growing preference for ethically sourced and manufactured products, drive the need for standards that ensure transparency, ethical sourcing, and fair trade practices.

How to identify gaps in current standards?

6. Collaboration with Standards Organizations:

- **Active Participation**: Don't just observe; actively participate in the standards development process. This could mean writing white papers, presenting findings, or joining standards committees.
- **Influence the Agenda:** Researchers can work to influence the agenda of standards organizations by highlighting the importance of certain gaps and the need for their closure.

7. Publishing Findings:

- **Standards Development Organizations (SDOs)**: Share your findings with SDOs. This could involve formal presentations, written communications, or participation in committee meetings.
- **Academic Journals**: Write and submit a detailed paper to peer-reviewed journals that are widely read by your academic and professional community. Choose journals that are known for impacting policy and practice.
- **White Papers and Reports**: Develop white papers and technical reports that can be more accessible to a wider audience, including industry practitioners and policymakers.

Award for Young Researcher at the
CEN and CENELEC
Standards+ Innovation Awards
2023

Innovating Local Energy Markets
Through Standardization

Introduction and Project Overview

Project Focus:

- Exploration of Standards, Policies, and Regulatory Frameworks in Local Electrical Energy Markets.
- Emphasis on the integration and enhancement of existing frameworks to better suit the unique needs of local energy markets.

Project Scope:

- Identification of gaps in current standards.
- Proposal of innovative solutions for P2P energy trading and efficient network management.

Methodological Approach and Gap Identification

Research Techniques:

Comprehensive Literature Reviews: Examining existing literature to establish a baseline understanding of current standards.

Case Studies: Analyzing real-world applications and their alignment with existing standards.

Comparative Analysis: Comparing local market needs with existing standard provisions.

Key Findings:

Identification of specific gaps such as insufficient frameworks for decentralized energy exchanges and P2P energy trading.

The need for enhanced guidance on managing network constraints and integrating distributed energy resources.

Innovative Solutions:

Proposing new frameworks tailored to local market characteristics, focusing on improving interoperability and efficiency.
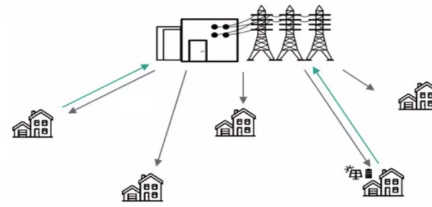
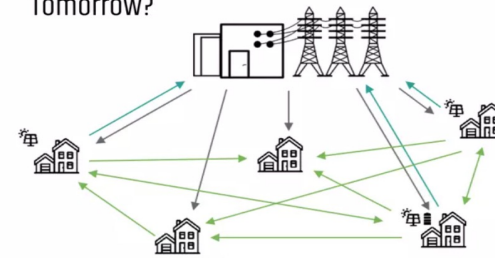# Paradigm shift of energy sector

Yesterday
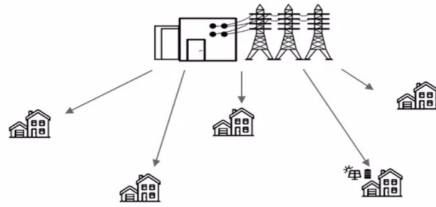
- Centralized generation
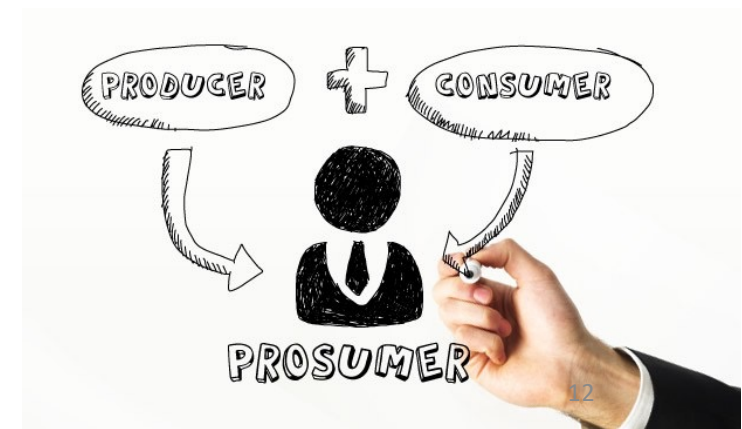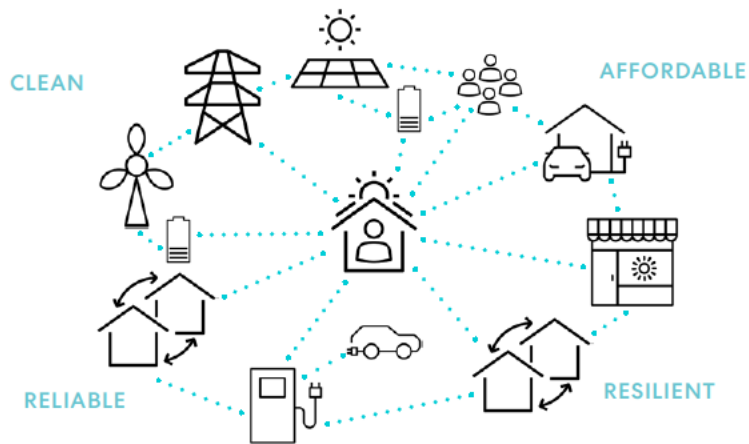- Unidirectional power flow

Today

- Increasing Distributed energy resources
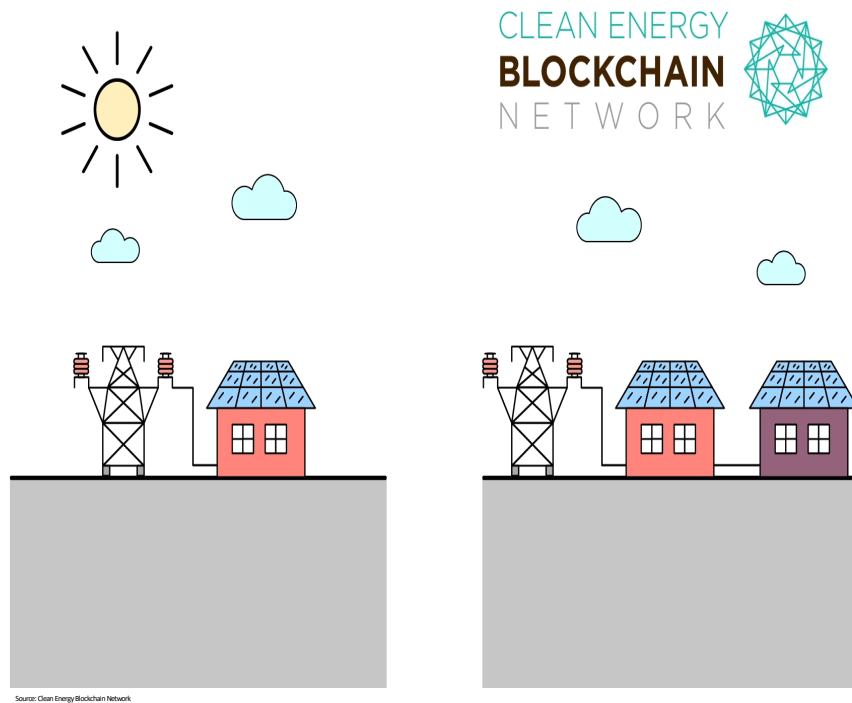- Prosumers sell to grid
- Bidirectional power flow

Tomorrow?

- Peer-to-Peer energy trading
- Prosumers sell to local community
- Consumers buy from prosumers first
- Dynamic pricing

CLEAN

AFFORDABLE

RELIABLE

RESILIENT

PRODUCER + CONSUMER

PROSUMER

Peer-to-Peer Energy Trading
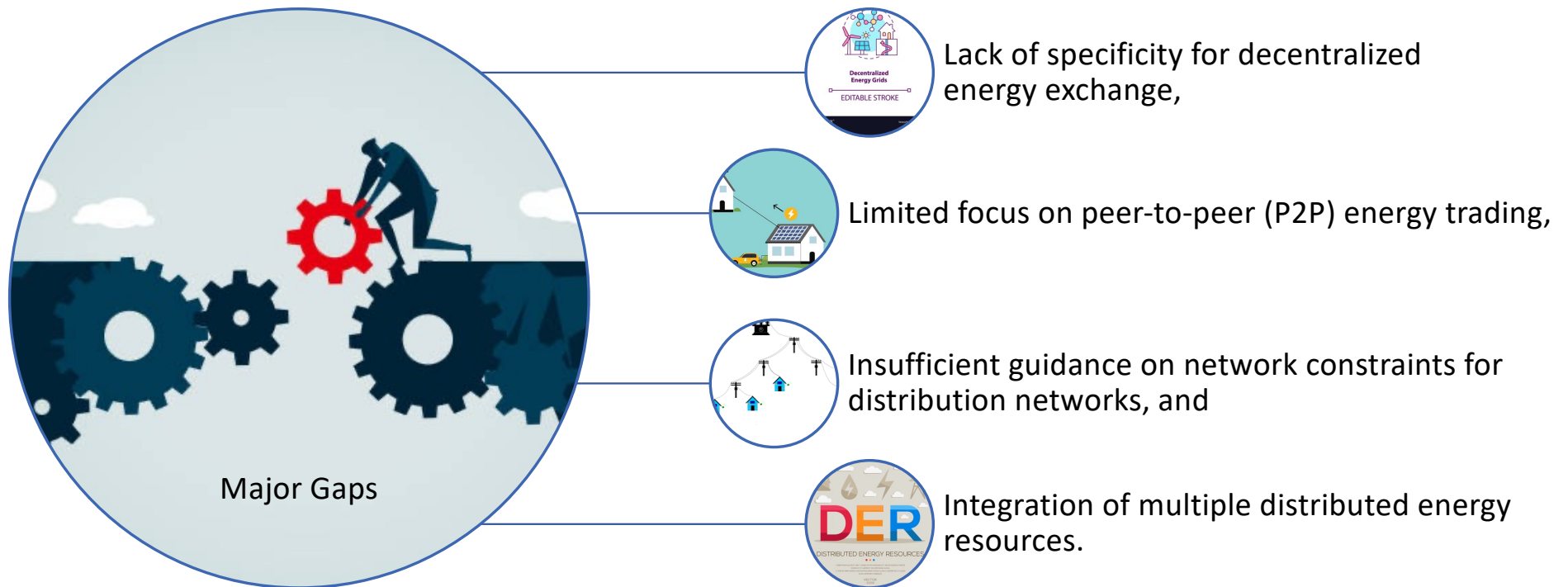

Source: Clean Energy Blockchain Network

Peer-to-Peer (P2P) energy trading is described as a platform to match prosumers and consumers using mutually accepted regulations and provide information about trading among players.
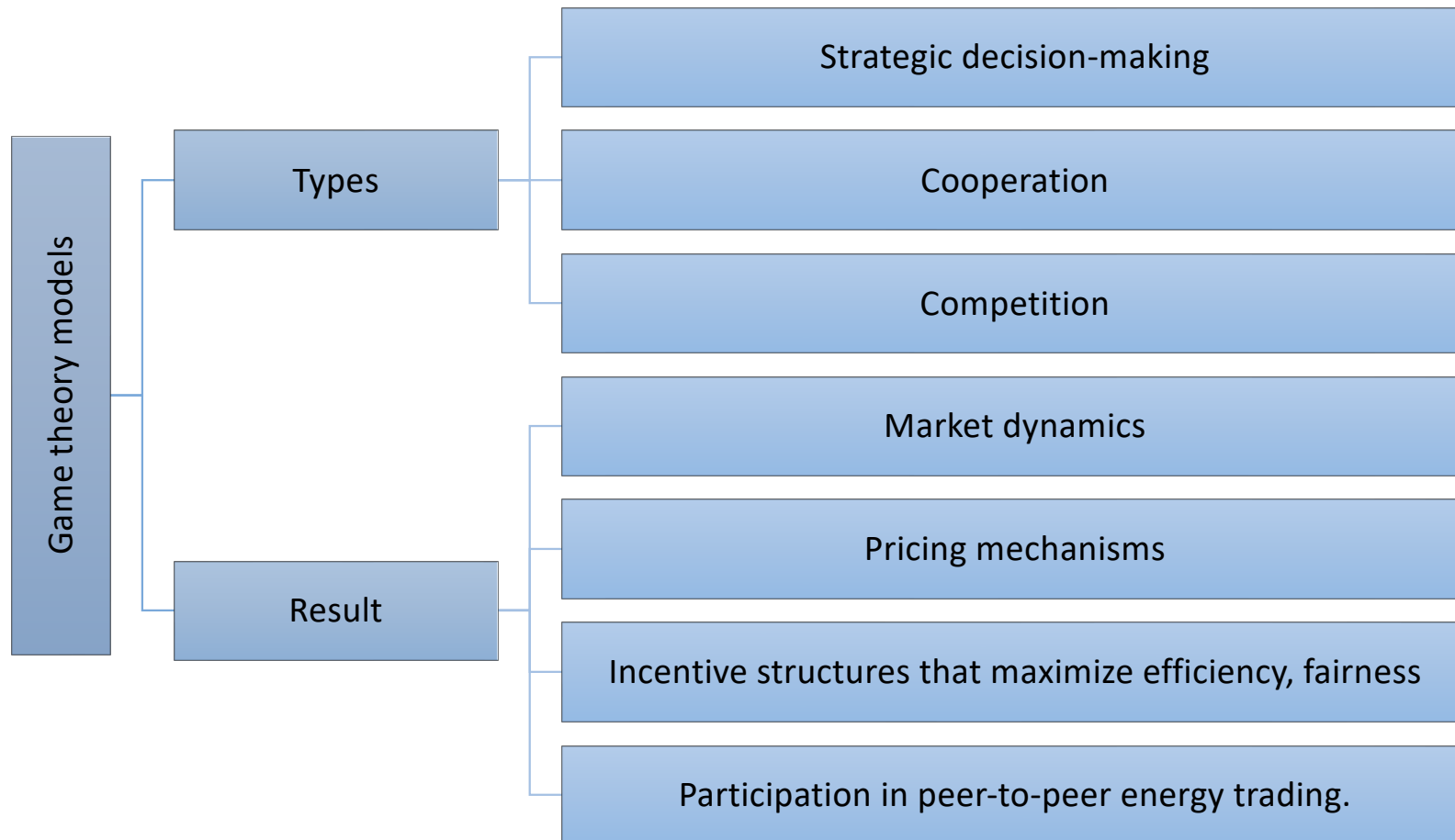
Advantages of P2P energy trading:

(a) Consumers save on electricity bill
(b) Prosumers generate revenue
(c) Reduce distribution and transmission losses
(d) Provide specific-purpose grid functions such as voltage management and demand response.
(e) Reduce their dependence on distribution companies and fossil-based power plants.
(f) Transaction fees for distribution companies and auctioneers.

Standards used and major gaps

- The study examined several relevant standards, including CENELEC EN 50438: Grid Connection Requirements for Distributed Generation, IEC 62746: Interoperability Framework for Demand Response and Distributed Energy Resources, and IEC 62559: Use Cases for Energy Management.

Major Gaps

Lack of specificity for decentralized energy exchange,

Limited focus on peer-to-peer (P2P) energy trading,

Insufficient guidance on network constraints for distribution networks, and

Integration of multiple distributed energy resources.

Technology used for the study

Game theory models

Types
- Strategic decision-making
- Cooperation
- Competition

Result
- Market dynamics
- Pricing mechanisms
- Incentive structures that maximize efficiency, fairness
- Participation in peer-to-peer energy trading.

Results

- By addressing the gaps in existing standards and developing new frameworks, this research work contributes to establishing a solid foundation for the **successful implementation and scalability of peer-to-peer energy trading and local energy markets**. It **enables stakeholders, policymakers, and industry players to adopt standardized** mechanisms that promote efficiency, reliability, security and sustainability in the energy sector.

- From a market perspective, the research findings enable the implementation of peer-to-peer energy trading projects in real-world distribution networks, **opening up new avenues for energy consumers, prosumers, and distribution system operators in local energy markets, leading to increased market efficiency, fairness, and competition**. This, in turn, stimulates market growth, attracts investments, and promotes the development of innovative energy technologies and services. Local energy markets **empower individuals and communities** by enabling local economic development, job creation, and increased energy independence.

- On a societal level, the research findings contribute to **sustainable development** and address pressing societal challenges. The integration of renewable energy sources and the decentralization of energy generation and consumption help **reduce carbon emissions** and mitigate the impacts of climate change.

Relevance to SDGs:

- Alignment with United Nations Sustainable Development Goals SDG 7: Affordable and Clean Energy, SDG 9: Industry, Innovation and Infrastructure, SDG 10: Reduced Inequalities, SDG 11: Sustainable Cities and Communities, and SDG 13: Climate Action.

Conclusion

Enhanced Innovation:
- Bridging standard gaps fosters an environment conducive to innovation, as researchers and developers have clear guidelines to work towards.

Improved Safety and Quality:
- Updated standards ensure products and services meet the highest safety and quality benchmarks, protecting consumers and enhancing brand reputation.

Operational Efficiency:
- Clear and current standards streamline production and operation processes, increasing efficiency and reducing waste.

Market Expansion:
- Well-defined standards can open up new markets by ensuring compatibility and interoperability between different systems and regions.

Facilitating Cutting-Edge Research:
- Addressing gaps allows researchers to push the boundaries of current technologies, exploring new frontiers in science and engineering.

Accelerating Adoption of Emerging Tech:
- Updated standards can speed up the integration of emerging technologies into the market, from renewable energy to AI and IoT.

IEC Young Professional Program

IEC GM 2022 Young Professional Workshop

IRELAND YOUNG PROFESSIONAL NETWORK

- Platform for networking
- Connect with current/former YP's
- Join National committee, Technical committee and working groups of IEC and CENELEC
- Roundtable workshops
- Meetups

Thank You!

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Next Generation Energy Systems Partnership Programme

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