

Standardizing DC Microgrids for Rural Electrification

Considerations and Stakeholder Participation

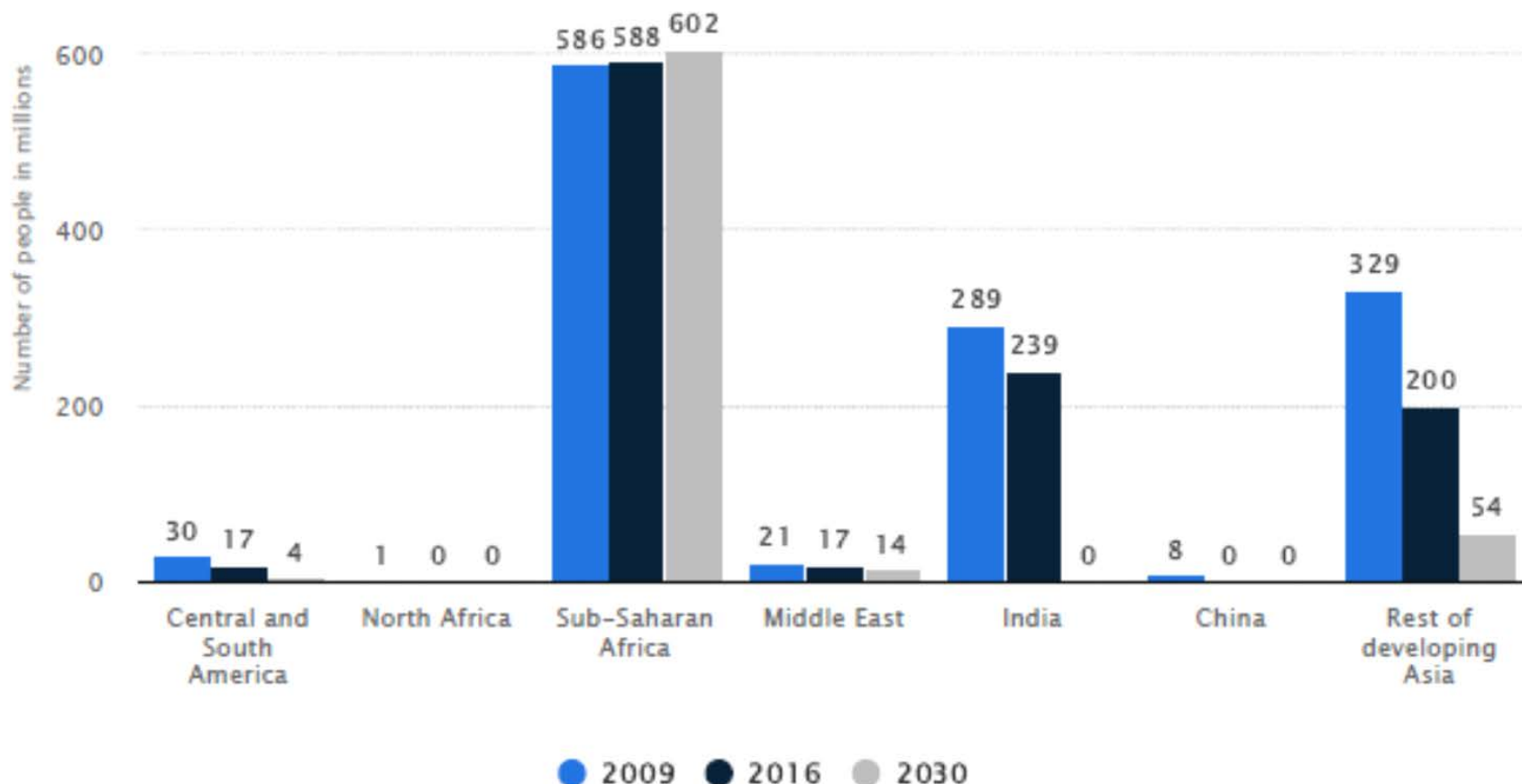
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Overview

- Progress towards increasing electricity access
- Description of IEEE P2030.10 Standard
- Standards produce practical benefits
- Stakeholders role in developing standards
- Lessons learned thus far
- Additional considerations
- How you can join

Projected Population Without Electricity Access (Millions)



“Forecast of global populations lacking electricity access in 2009/2016/2030.” Statista,
<https://www.statista.com/statistics/561428/forecast-of-population-without-access-to-electricity-globally-by-region/>

IEEE P2030.10 Standard

- P2030.10 Working Group is developing a standard for DC microgrids for rural and remote electricity access applications.
- Scope includes design, operations, and maintenance
- Purpose is to provide safe and economic access to electricity and to facilitate clean renewable energy

Practical Benefits of Standardization

- Ensure safety.
- Streamline the architecture; reduce engineering cost.
- Facilitate reliability, quality, compatibility and interoperability.
- Simplify product development resulting in lower prices; promote economies of scale.
- Create trust.

Critical to P2030.10 Success

- Use cases
- Stakeholder participation
- Global adoption

Stakeholder Task Group

- The objective of this task group is to enable meaningful involvement by identified stakeholders and other interested parties.
- Stakeholders include governments, manufacturers, investors, banks, NGOs and any interested party.

Benefits of Stakeholder Participation

- For manufacturers or project developers, it gives them an opportunity to provide comments and feedback regarding practical applications.
- For financiers, it provides information which enables them to feel comfortable with the bankability, reliability or quality of an asset.
- For governments, it provides information which can potentially inform policies and regulations.

Stakeholder Anecdotes

- The best planning in the world doesn't anticipate how the customer will actually use the system. Engage the community.
- Customers are aspirational and will exceed the capacity of their system eventually.
- When systems malfunction and repairs are slow, public perception could turn.
- Power theft and tampering with systems is an ongoing issue.

Lessons Learned Thus Far...

- Standard development is challenging
- Many considerations need to be weighed carefully
- Focusing on the customer helps to clarify some of the considerations
- Use an approach that is grounded in real life experience
- Test the standard to ensure it meets objectives
- Involve and engage stakeholders early and often

Considerations

- No cohesive set of standards exists for low voltage off-grid DC microgrids.
- Develop something specifically for the developing world, not a stripped down version of an existing product in the developed world.
- Anticipate change such as load growth or future innovation and try to address it.

Additional Considerations

- Will standard result in a layer of regulation that increases the cost of systems?
- Enable the work being done to:
 - increase access by developing a market for reliable quality products
 - make systems affordable for remote communities
 - increase awareness and adoption amongst installers, manufacturers, governments, financial institutions

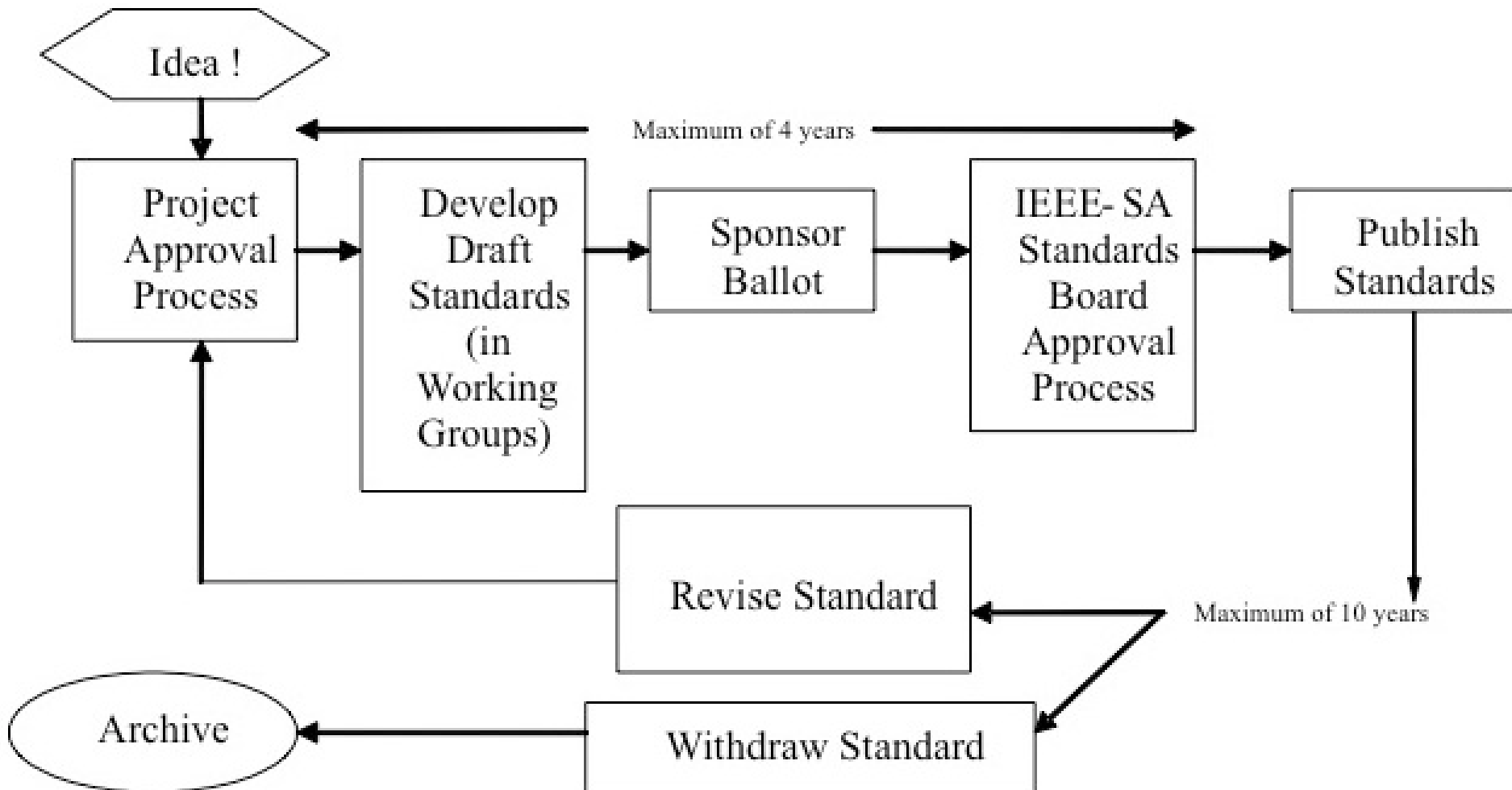
Additional Questions to Consider

- Does standardization stifle innovation?
- What is the right balance of cost and complexity?
- Who will engineer?
- How can power theft be addressed?
- How can loads be managed and prioritized?
- O&M: Who will maintain and repair the system?

How you can participate

- Join the P2030.10 working group
 - Meeting is 3rd Thursday of month at 8 AM PT
- Share your experience with off-grid systems
- Contribute to the draft standard
- Review the draft standard

Standards Development Overview



“How are standards made.” IEEE Standards Association,
<http://standards.ieee.org/develop/process.html>

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