Leveraging Machine learning for Sustainable and Self-sufficient Energy Communities

NeurIPS 2020 Workshop

Tackling Climate Change with Machine Learning

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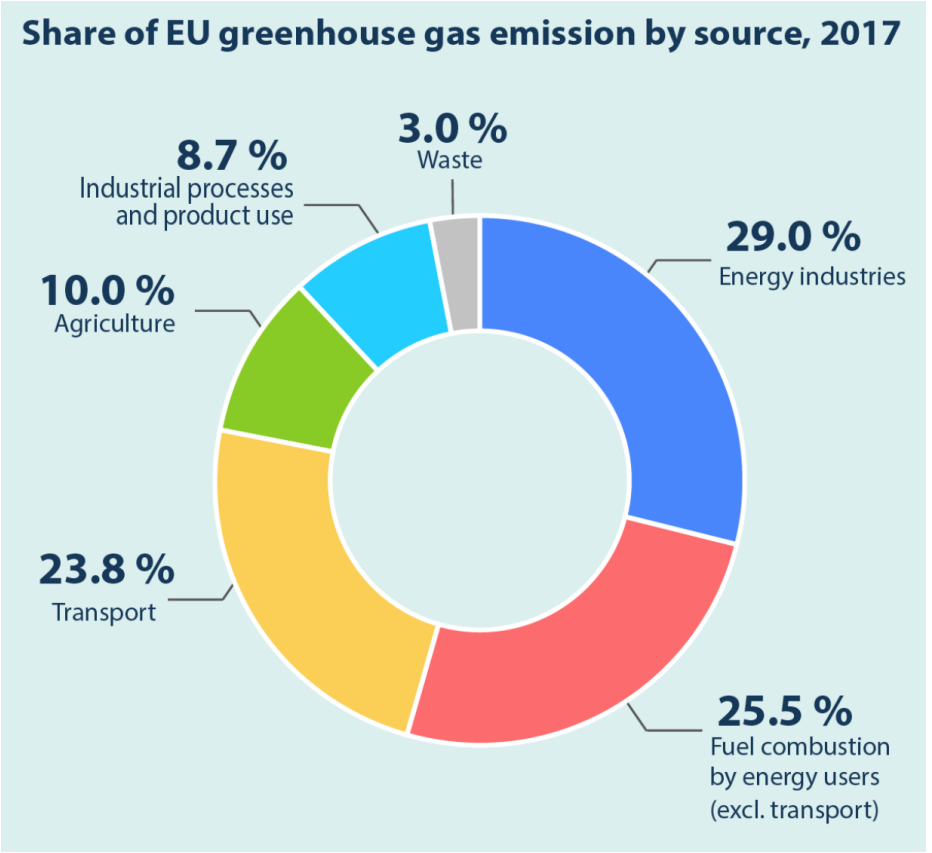
NEURAL INFORMATION PROCESSING SYSTEMS

Outline

1. Introduction
2. RES and Community Energy
3. Proposed Technical Solution
4. Impacts
5. Conclusion

Introduction

- Energy production and use account to ⅔ Green House Gas (GHG) emissions.
    - Paris Agreement : >70% reduction of GHG energy-related by 2050.

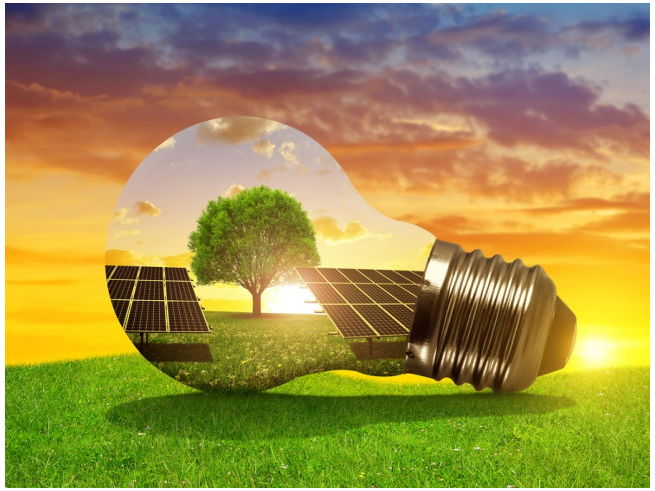


source: European Environment Agency

Speeding up innovation in Energy sector => Promote renewable energy.

Role of RES

- RES with efficient energy management strategies can achieve.



source: Trade time

  - >90% reduction of GHG
  - Meet Paris-agreement.
  - Contribute to climate change mitigation.

Needs for innovation that:

1. Enhance performance of RES
2. Integrate high share of RES into the grid.
3. Create affordable solution for end-users.

Communities Energies (CEs)

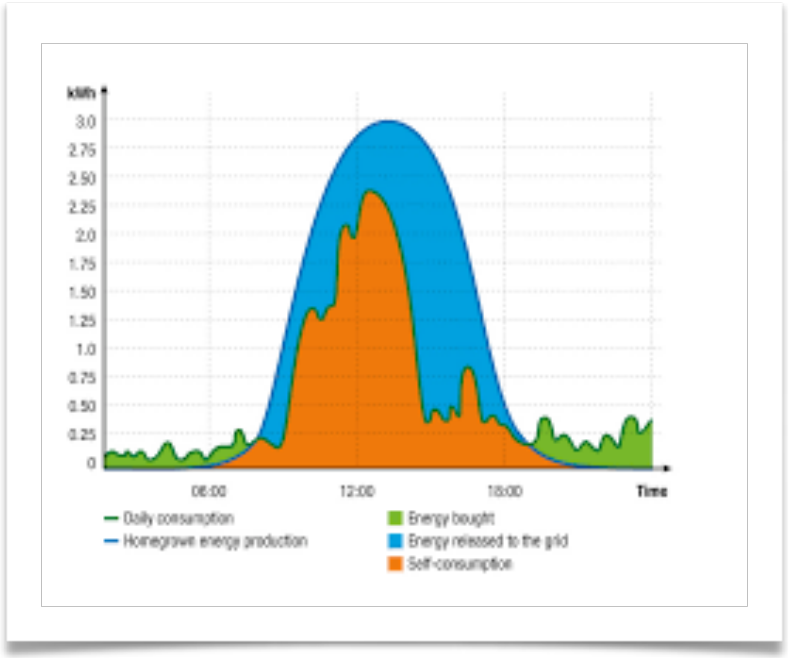
- New approaches to unlock growth in RES.

source: Trade time

source: Friend of the Earth Europe

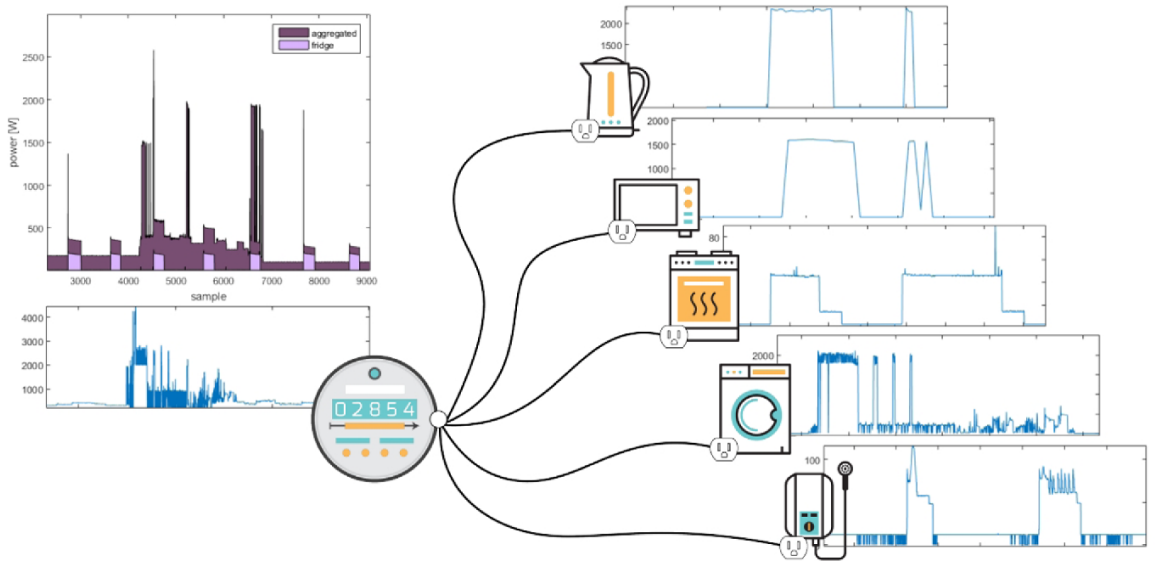
CEs: Energy Management Challenges

- Energy management => self-consumption of CEs.



Proposed Technical Solution

1. Value-propositions of data-driven and other machine learning approaches in smartening and enhancing energy-management practices in CEs.



Proposed Technical Solution

1. Build capacity in Africa through knowledge transfer and awareness creation.

Impacts

1. Introduce data-driven and machine learning innovation to leverage the potential of CEs in Africa.
2. Empower stakeholders in the energy sector to use, scale and adopt innovative data-driven and ML solutions.

Conclusion & Future Work

- Improving efficiency of the electricity consumption is important towards reducing GHG and ensuring sustainability of access to electricity.
- We propose CEs to encourage self-consumption and improve energy awareness using data-driven techniques and mitigate climate change.

Thank You!

For Your Attention

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