Oregon State University

Climate Solutions Consulting

Sensor-Based KPT

Good practices and lessons learned

Olivier Lefebvre (Climate Solutions) & Nordica MacCarty (OSU)

What is a Sensor-based Kitchen Performance Test?

- Follow core concepts of KPT
- Use of **data-logging scale** to continuously measure fuel consumption
- Use of **stove use monitor** to monitor corresponding stove usage

Full guidelines available here:
https://climate-solutions.net/images/Documents/KPT_SensorBased_11_15_2024.pdf

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KITCHEN PERFORMANCE TEST

UPDATE TO INCLUDE SENSOR-BASED METHODS

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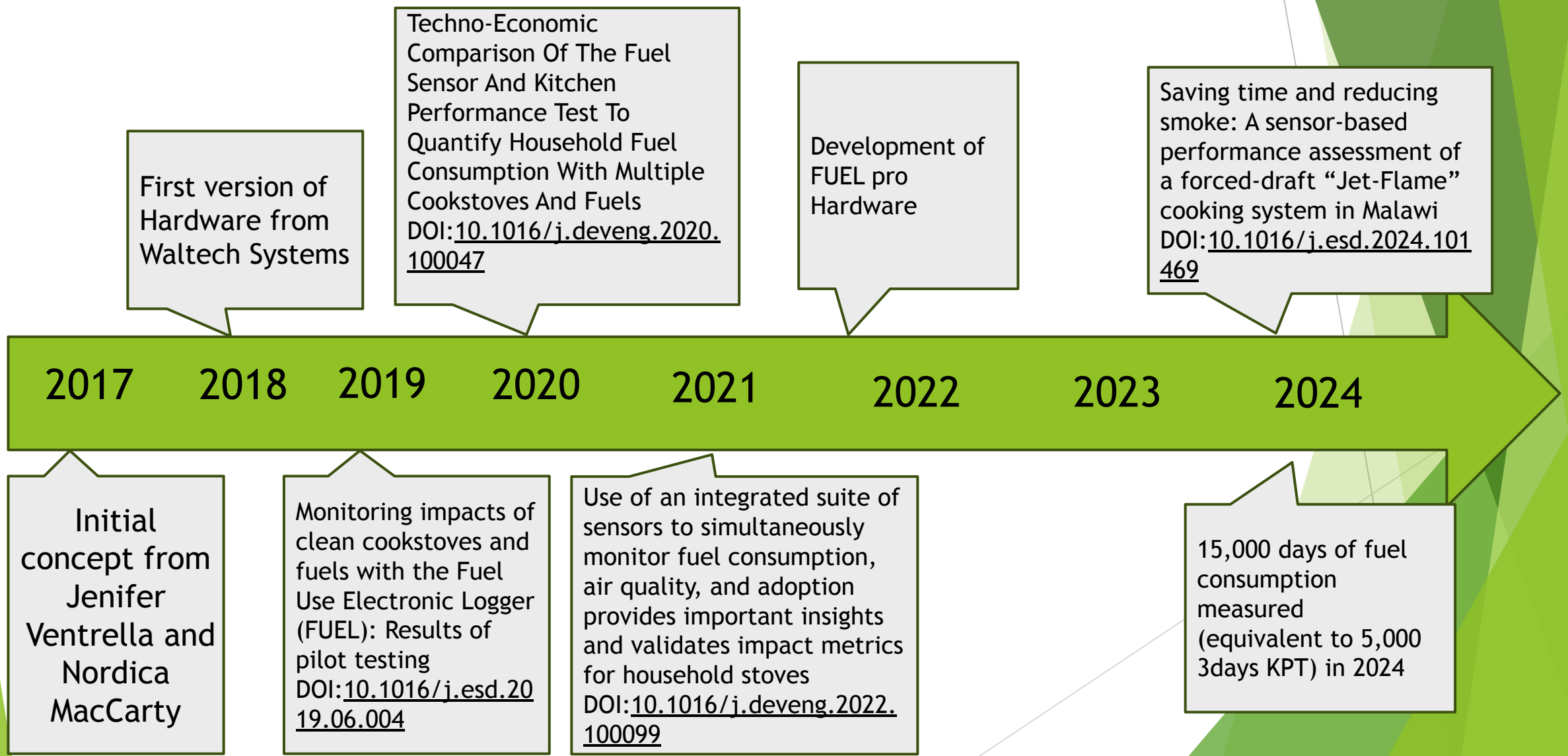
A brief history of FUEL data-logging scales



Sensor hardware evolution

2017

2019

2021

Role of Stove Use Monitor

- On the project stove only: this is an easy way to control and correct for Hawthorne effect

- On all stoves in the household:
  - Determination of baseline technology displacement rate
  - Advanced non compliance detection

Good Practices

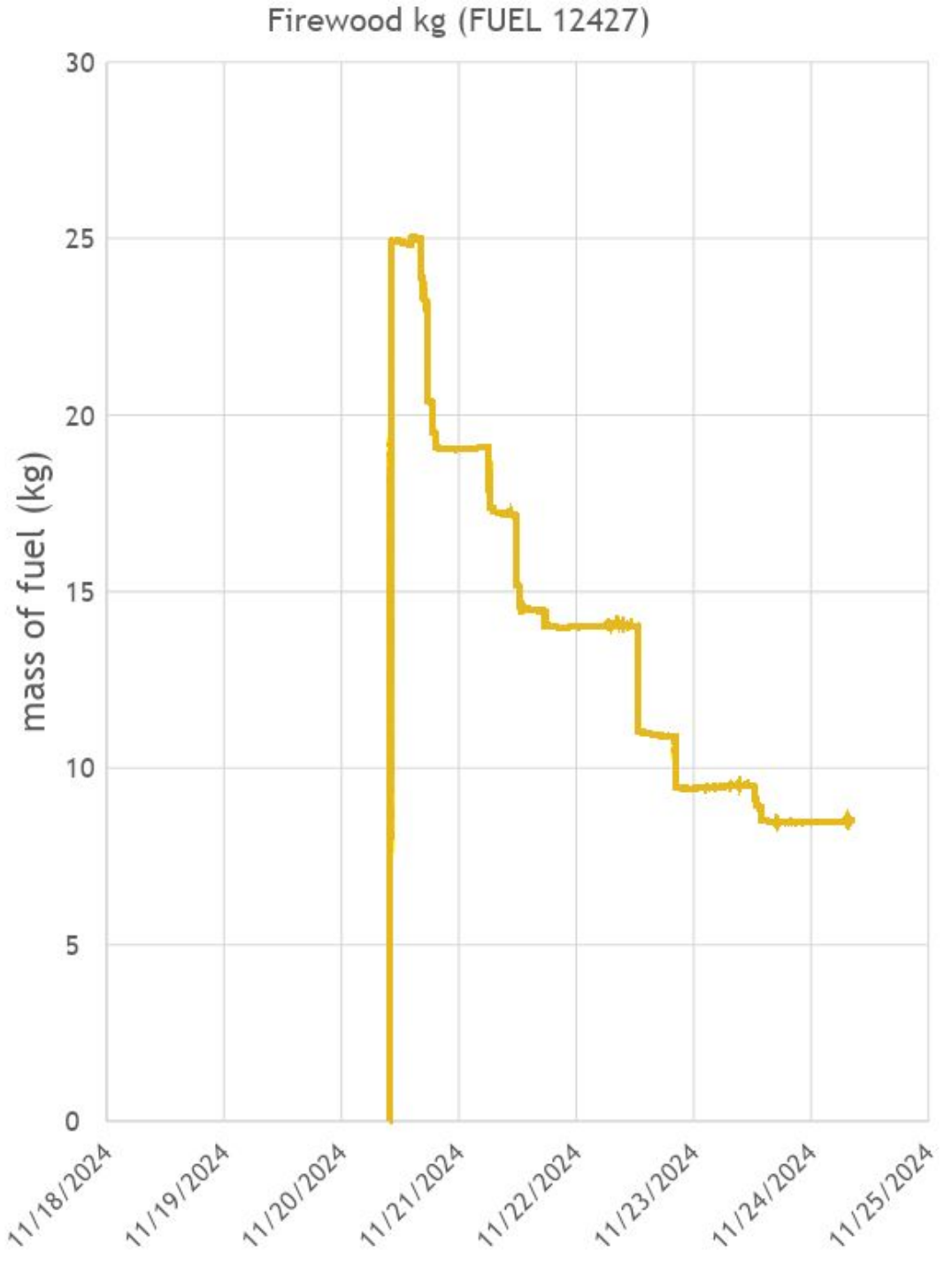
- Deployment location
  - Avoid deploying outside (rain, wind)
  - Close to the stove
  - Out of the way of the cook
  - Not touching wall or objects
- One FUEL sensor per fuel type
- Local fuel holder
- Secure the holder to the scale
- Fill the holder before leaving

Cook Training

- Only use fuel from fuel holder in your own household
- Ensure all fuel used in your household was first place in the fuel holder
- Only refill when fuel holder is empty or nearly empty
- Do not replace left over fuel at the end of the cooking events

Basic Data processing

- 5-minute window running median pass
- Remove the last 5 minutes
- Calculate minute by minute mass change
- Use a 20g threshold to remove small variation due to creep and temperature variation



Comparison with regular KPT

- No need to provide fuel
- Less labor intensive
- Auditable/Transparent
- Hawthorne effect
- Possibility of advanced analysis:
  - Advanced compliance analysis
  - Stove power analysis

What's next ?

- **Methodology paper**: advanced processing techniques based on large dataset from Malawi Rwanda Togo.
- Inclusion in a growing number of carbon projects

Full digital KPT guidelines available at:
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