ISO/TC255 WG3
HOUSEHOLD BIOGAS SYSTEM

Journey from Idea to Publication
AGENDA

- Household Biogas Systems Recap
- Standard Recap
- How and Why it all began?
- Overview of ISO process
- Difficulties in the process
- Standard Adoption Status
• This standard for Household Biogas Systems covers the small sized production and output of biogas for personal use in homes, kitchens, small farms, etc.

• The standard is applicable to all types and styles of Household Biogas Systems, and it does not address any particular manufacturer of household biogas systems.
2.5 BILLION PEOPLE WORLDWIDE DO NOT HAVE ACCESS TO BASIC SANITATION

REFERENCE: UNICEF
3 BILLION PEOPLE IN THE WORLD USE WOOD AND CHARCOAL FOR COOKING

REFERENCE: WORLD HEALTH ORGANIZATION (WHO)
1 HOUR COOKING = 400 CIGARETTES
4.3 MILLION PEOPLE DIE EVERY YEAR FROM EXPOSURE TO INDOOR AIR POLLUTION

REFERENCE: WORLD HEALTH ORGANIZATION (WHO)
IN SUB-SAHARAN AFRICA,

**TREES ARE CUT DOWN**

FOR FUEL AT 2X THE RATE OF THEIR GROWTH

REFERENCE: WORLD HEALTH ORGANIZATION (WHO)
1.3 BILLION TONNES
OF FOOD WASTED EVERY YEAR

REFERENCE: FOOD AND AGRICULTURE ORGANIZATION (FAO)
A Household Biogas System operates as a continuous-flow system, i.e. organic waste is fed in one end, and the gas and fertilizer are emitted from the other. The generated biogas is filtered to remove any unpleasant odors and toxic gases.
FROM LINEAR TO CIRCULAR ECONOMY

**Linear Economy**
- Take → Make → Waste
- Energy from finite sources

**Circular Economy**
- Upcycle
- Waste → Resource
- Energy from renewable sources
SYSTEMS TYPES

Kenya

Israel / USA
**SYSTEMS TYPES**

- Rwanda
- Mexico
• This standard covers the requirements for the design, installation, operation, maintenance and the safety of Household Biogas Systems (HBSs), producing biogas in an amount equivalent to an installation capacity of less than 100 MWh per year.

• The standard applies to HBSs comprising of pipeline and equipment with pressure levels of less than 5 kPa.

• Any equipment or appliances connected to an HBS or utilizing the biogas energy of an HBS are not a part of the scope of this standard.
Organic Waste → Biomass Slurry → Anaerobic Digester → Biogas Storage

- Sludge removal outlet
- Digestate overflow
- Automatic release valve

Biogas transfer pipe → Biogas Shutoff valve → Appliance: Stove, lamp, water heater

Sulfide Filter → Condensate release valve
1. Scope
2. Normative References
3. Terms and Definitions
4. Abbreviated Terms
5. System Design
6. Components Testing and Sampling Criteria
7. System Manuals
8. Prerequisites for Installation
9. Household Biogas System Operation
10. Maintenance & Troubleshooting
11. Markings
12. Safety
13. Warranty and Guarantee
• 2012 - HomeBiogas looking for standard in Israel and offered to join TCC255
• 2013-2016 – Definitions standard of committee – doing order in the field of biogas
• 2016 – WG3 Established for Household Biogas systems by Oshik Efrati, HomeBiogas CEO
• First WG 3 Meeting in Israel- October 2017
• NWIP for vote – June 2018, NWIP approved- September 2018
• Second WG 3 Meeting in Paris - October 2018
• CD for vote – May 2019, CD Approved – July 2019 (9 Approved, 1 Disapproved)
• Third WG 3 Meeting in Toronto - October 2019
  • DIS version approved by after comments review
  • Resolution to proceed with DIS
• DIS for vote – January 2020, DIS Approved – Apr 2020 (14 Approved, 0 Disapproved)
• Forth WG3 meeting by zoom – approved comments on DIS for FDIS submission
• FDIS approved – October 2020
• IS Approved – December 2020
<table>
<thead>
<tr>
<th>Stage</th>
<th>Version</th>
<th>Description</th>
<th>Edit draft</th>
<th>Target date</th>
<th>Limit date</th>
<th>Started</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>1</td>
<td>Proposal for new project registered</td>
<td></td>
<td>2018-06-15</td>
<td>2018-06-18</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>1.20</td>
<td>1</td>
<td>New project ballot initiated</td>
<td></td>
<td>2018-06-18</td>
<td>2018-06-18</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>1.60</td>
<td>1</td>
<td>Close of voting</td>
<td></td>
<td>2018-09-10</td>
<td>2018-09-10</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>1.99</td>
<td>1</td>
<td>New project approved</td>
<td></td>
<td>2018-10-31</td>
<td>2018-10-31</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>2.00</td>
<td>1</td>
<td>New project registered in TC/SC work programme</td>
<td></td>
<td>2018-10-31</td>
<td>2018-10-31</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>3.00</td>
<td>1</td>
<td>Committee draft (CD) registered</td>
<td></td>
<td>2019-05-21</td>
<td>2019-05-21</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>3.20</td>
<td>1</td>
<td>CD study/ballot Initiated</td>
<td></td>
<td>2019-05-21</td>
<td>2019-05-21</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>3.60</td>
<td>1</td>
<td>Close of voting/comment period</td>
<td></td>
<td>2019-07-15</td>
<td>2019-07-15</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>3.99</td>
<td>1</td>
<td>CD approved for registration as DIS</td>
<td></td>
<td>2019-07-24</td>
<td>2019-07-24</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>4.00</td>
<td>1</td>
<td>DIS registered</td>
<td>2019-09-16</td>
<td>2019-09-16</td>
<td>2019-11-11</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>4.20</td>
<td>1</td>
<td>DIS ballot Initiated</td>
<td></td>
<td>2020-01-13</td>
<td>2020-01-13</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>4.60</td>
<td>1</td>
<td>Close of voting</td>
<td></td>
<td>2020-04-06</td>
<td>2020-04-06</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>4.99</td>
<td>1</td>
<td>Full report circulated: DIS approved for registration as FDIS</td>
<td></td>
<td>2020-05-07</td>
<td>2020-05-07</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>5.00</td>
<td>1</td>
<td>Final text received or FDIS registered for formal approval</td>
<td></td>
<td>2020-08-10</td>
<td>2020-08-10</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>5.20</td>
<td>1</td>
<td>Proof sent to Secretariat or FDIS ballot Initiated: 2 months</td>
<td></td>
<td>2020-09-02</td>
<td>2020-09-02</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>5.60</td>
<td>1</td>
<td>Close of voting -- Proof returned by Secretariat</td>
<td></td>
<td>2020-10-28</td>
<td>2020-10-28</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>6.00</td>
<td>1</td>
<td>International Standard under publication</td>
<td></td>
<td>2020-12-10</td>
<td>2020-12-10</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>6.60</td>
<td>1</td>
<td>International Standard published</td>
<td>2020-12-10</td>
<td>2020-10-31</td>
<td>2020-12-10</td>
<td>Current</td>
<td></td>
</tr>
<tr>
<td>9.00</td>
<td>1</td>
<td>International Standard under periodical review</td>
<td></td>
<td>2025-10-15</td>
<td>2025-10-15</td>
<td>Awaiting</td>
<td></td>
</tr>
<tr>
<td>9.20</td>
<td>1</td>
<td>Close of review</td>
<td></td>
<td>2025-10-15</td>
<td>2025-10-15</td>
<td>Awaiting</td>
<td></td>
</tr>
<tr>
<td>9.92</td>
<td>1</td>
<td>International Standard to be revised</td>
<td></td>
<td>2026-03-04</td>
<td>2026-03-04</td>
<td>Awaiting</td>
<td></td>
</tr>
<tr>
<td>9.93</td>
<td>1</td>
<td>International Standard confirmed</td>
<td></td>
<td>2026-03-04</td>
<td>2026-03-04</td>
<td>Awaiting</td>
<td></td>
</tr>
<tr>
<td>9.99</td>
<td>1</td>
<td>Withdrawal of International Standard proposed by TC or SC</td>
<td></td>
<td>2026-03-04</td>
<td>2026-03-04</td>
<td>Awaiting</td>
<td></td>
</tr>
<tr>
<td>95.99</td>
<td>1</td>
<td>Withdrawal of International Standard</td>
<td></td>
<td>2026-03-04</td>
<td>2026-03-04</td>
<td>Awaiting</td>
<td></td>
</tr>
</tbody>
</table>
HOUSEHOLD BIOGAS SYSTEM – PROGRESS OVER TIME
HOUSEHOLD BIOGAS SYSTEM – DIFFICULTIES

- How to start?
- Assistance
- Order of stages
- Accepted by All
- Budget
- Politics
- Adoption of standard
ISO 23590:2020
Household biogas system requirements: design, installation, operation, maintenance and safety

Abstract
This document covers the requirements for the design, installation, operation, maintenance and the safety of Household Biogas Systems (HBSs), producing biogas in an amount equivalent to an installation capacity of less than 150 m³/m²/year.

The document applies to HBSs comprising of pipeline and equipment with pressure levels of less than 5 MPa.

4.2 Monitoring and Reporting
Since this is a pilot project, performance data of the units as well as beneficiary satisfaction is key in determining potential scale up of the biogas. A monitoring plan should be devised to collect data on performance of the units in terms of biogas and digestate generated. It is equally important to obtain beneficiary perception on the use of the biogas units. A project report shall be provided with details on the installation process.

Robustness
Gas compartment should be airtight preventing unintentional gas leaks. The material of the entire unit should be of high-quality offering protection against harsh weather and destruction from rodents such as termites.

Conformity
ISO 23590:2020

Serviceability
Low maintenance requirements with limited moving parts.