

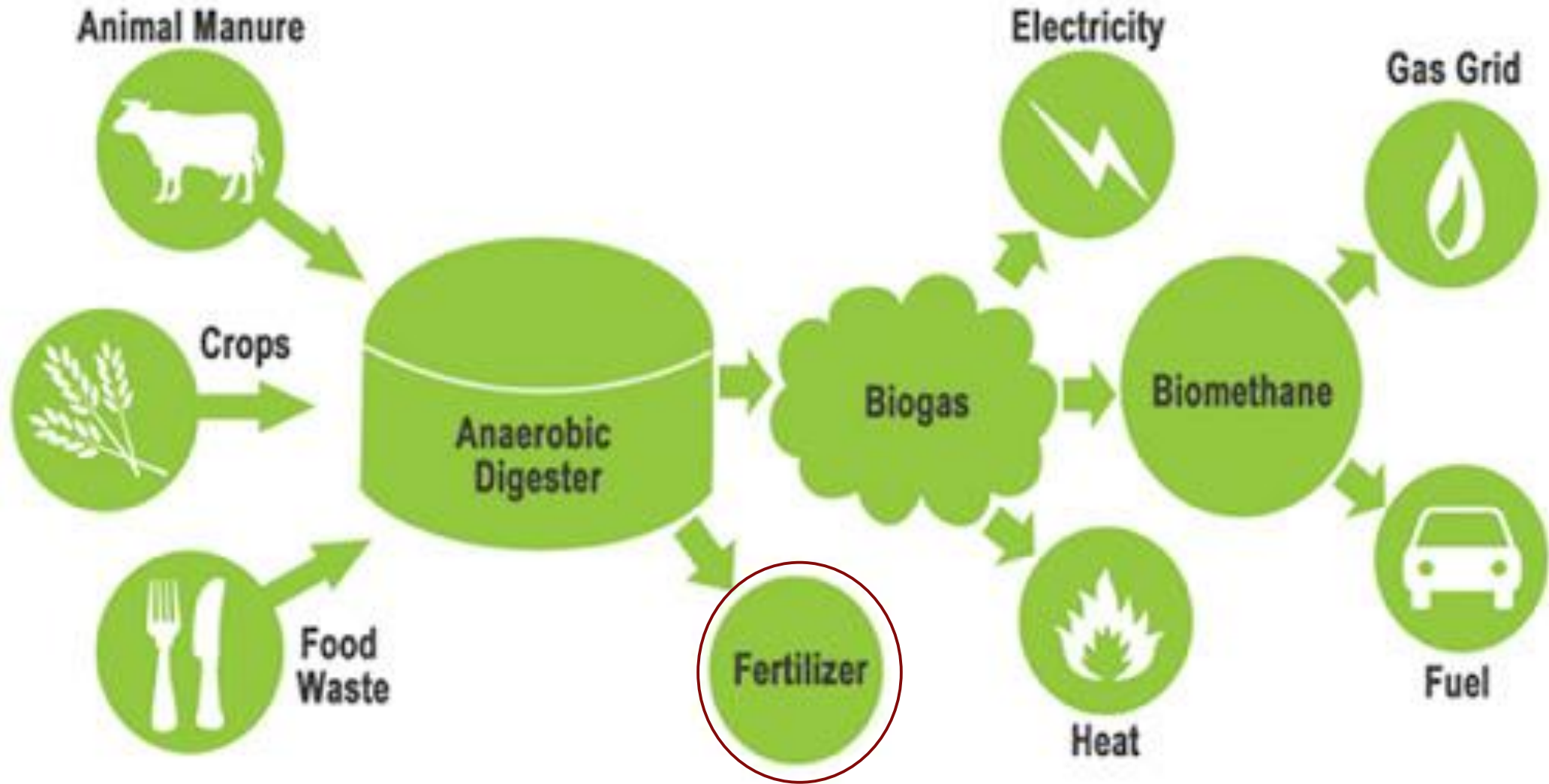


Bio-fertilizer from Biogas

(RE for Agriculture)

KUSHAL GURUNG

Anaerobic Digestion







Process: Feed to Fertilizer

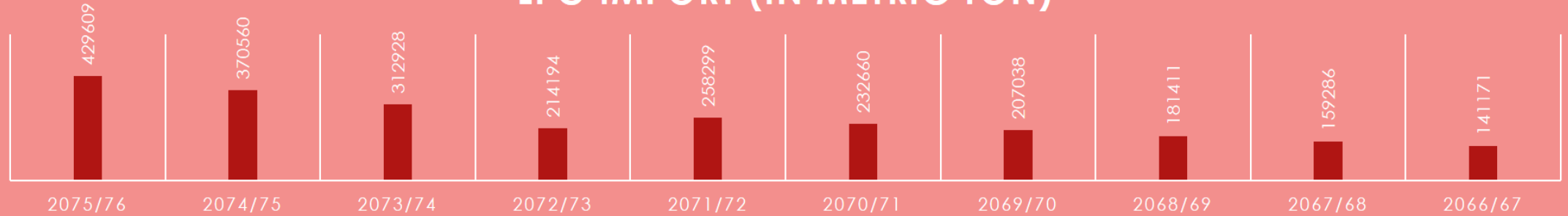
1. Feeding
 - ❑ Mixed feedstock and water (1:1)
 - ❑ Test- impurities, Volatile Fatty Acid, Total Inorganic Carbon, pH
2. Anaerobic digestion process (35-40 days)
 - ❑ Slurry
3. Solid-Liquid separation
 - ❑ Digestate (70-80% moisture)
4. Windrow composting and further enrichment (40-45 days)
 - ❑ Biochar, Ash, Rapeseed cake, EM, Trichoderma
5. Bio-fertilizer
 - ❑ per GoN standard- NPK, Micronutrient, Moisture
 - ❑ Bagging (indefinite shelf life)



Feedstock to
dry fertilizer
(6:1)

Opportunities

LPG IMPORT (IN METRIC TON)



| Total Municipalities (based on 2013) | Organic material (%) | Total waste generation (MT/day) | Total organic fraction (MT/day) | Production of Biogas (m ³ per day) & convert to BioCNG | LPG replacement per day (cylinder) | LPG replacement per year | Organic fertilizer per year (MT) |
|--------------------------------------|----------------------|---------------------------------|---------------------------------|-------------------------------------------------------------------|------------------------------------|--------------------------|----------------------------------|
| 58 | 60 | 1,782 | 1,070 | 64,000 / 35,280 | 2,500 | 912,500 | 65,000 |

- Fertilizer demand in Nepal: 700,000 tons annually
- Total chemical fertilizer import is equivalent to Rs 10-15 billion annually
- Last fiscal year, around 30.5 million LPG cylinders were imported, worth Rs. 32.92 billion

- Total no of cows and buffaloes: 1.3 million; Total no of chicken: 600 million
- Total manure production from livestock : 38,000 MT/day
- Potential Biogas production = 2,280 MT m³/day = 1,254 MT BioCNG m³/day
- 20% of total potential= 250.8 MT BioCNG m³/day = 17,774 LPG cylinder/day = **6.48 million LPG cylinder/year**
- Potential Organic fertilizer production = 6,300 MT/day = **2.3 million MT/year**

Reduce LPG import by 25%!

स्वच्छ र स्वदेशी



Gandaki Urja Pvt. Ltd