



Sharing Session

On-site Solid Waste Treatment Technology/ *Teknologi Olah Sampah di Sumbernya* (TOSS) 🖐️ 🖐️ 🖐️

By:

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Universitas Andalas in collaboration with **Comestoarra.com**





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EDUCATIONS:

- B.Eng. in Environmental Engineering, **Institut Teknologi Bandung, Indonesia** (1999)
- M.Sc. in Clean Technology, **Newcastle University, United Kingdom** (2001)
- Dr. in Energy Science, **Kyoto University, Japan** (2012)
- Professional Engineer, **Universitas Andalas, Indonesia** (2021)

AFFILIATIONS:

- ✓ Lecturer at Department of Environmental Engineering, Faculty of Engineering, Unand (2001~now)
- ✓ Lecturer at Post-graduate Program Unand (2012~now)
- ✓ Researcher at Center for Environmental Studies (CES) Unand (2004~now)
- ✓ Head of Air Quality Lab Unand (2005~2009, 2017, 2020~now)
- ✓ Board of expert at CES Unand (2019~now)
- ✓ Coordinator of Master Course in Environmental Science Unand (2014~2018)
- ✓ Director of CES Unand (2015~2019)



ORGANIC WASTE IN INDONESIA

The typical communal waste in Indonesia, which has high moisture content and mixed with inorganic waste. The inability to segregate the organic and inorganic waste at the source has challenged all stakeholders to solve the waste management problems.



Source: Comestoarra, 2023



Organic Waste around Us (2)

BIOMASS RESIDUES IN INDONESIA



Source: Comestoarra, 2023





TOSS Converts **Organic Waste** into Alternative Fuels



1. ORGANIC WASTE AND
BIOMASS RESIDUES
COLLECTION



2. BIOACTIVATOR FOR
BIODRYING PROCESS



3. BIORDYING
PROCESS ON
BAMBOO BOX



4. CRUSHING AND
PELLETIZING



5. FLUFF PRODUCT
BASED ON SNI BBJP



6. SOLID RENEWABLE FUEL
PRODUCT BASED ON SNI BBJP



1



2



3



4



5



PERBEKEL SUMERTA KAJA
KOTA DENPASAR

PERATURAN DESA SUMERTA KAJA
NOMOR 9 TAHUN 2020

TENTANG

SWAKELOLA SAMPAH
DALAM RANGKA PENINGKATAN PENDAPATAN ASLI DESA

<https://www.youtube.com/watch?v=1u-kc1dsell>



TOSS at Universitas Andalas





Yard Waste Treatment at Universitas Andalas



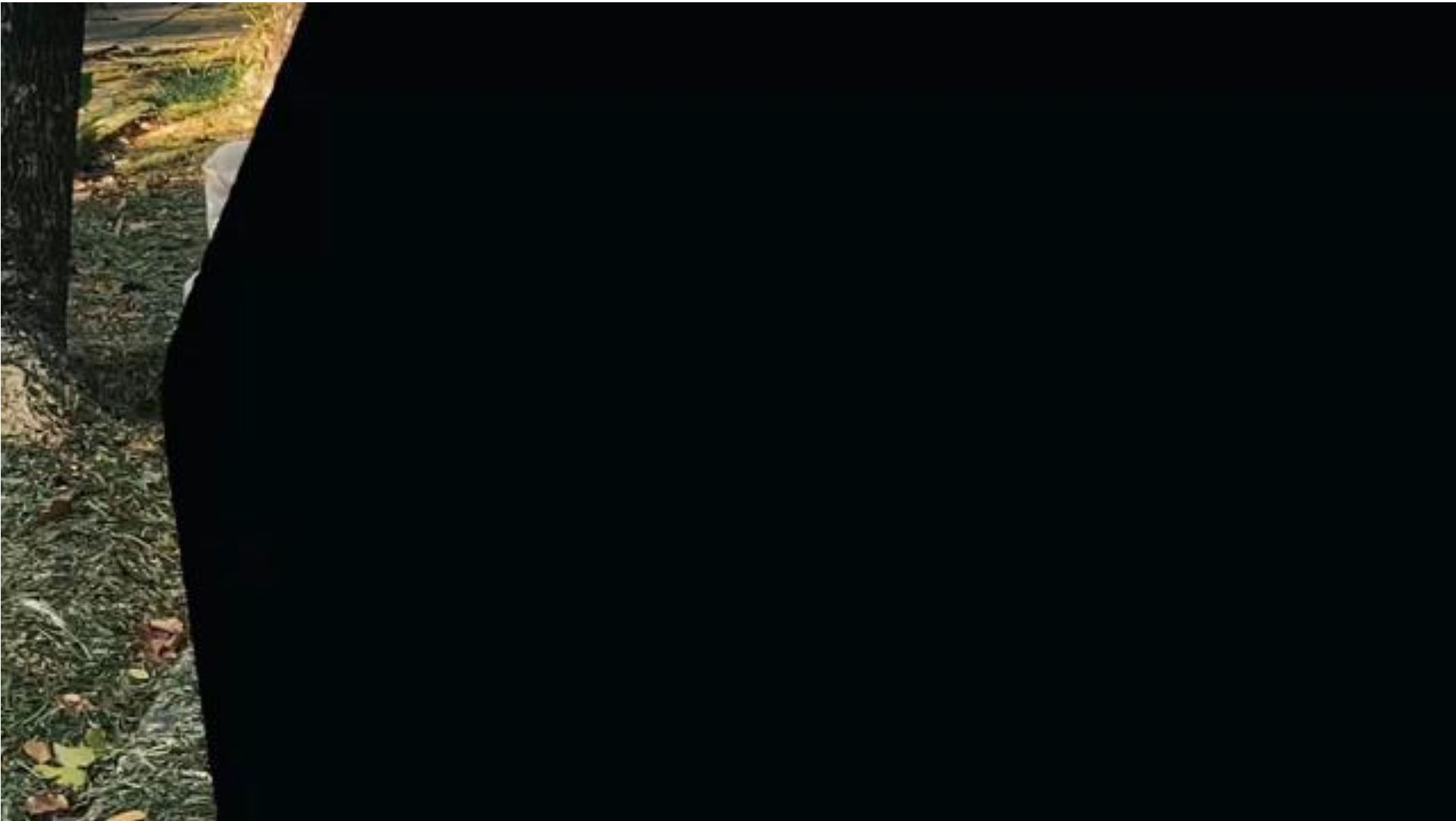
Product Improvement (from fluff to pellets)





TOSS at Unand Campus

Kampus
Merdeka
INDONESIA JAYA



<https://www.youtube.com/watch?v=-Dv8Mfk2kGA>



01



02



03



04



05



06



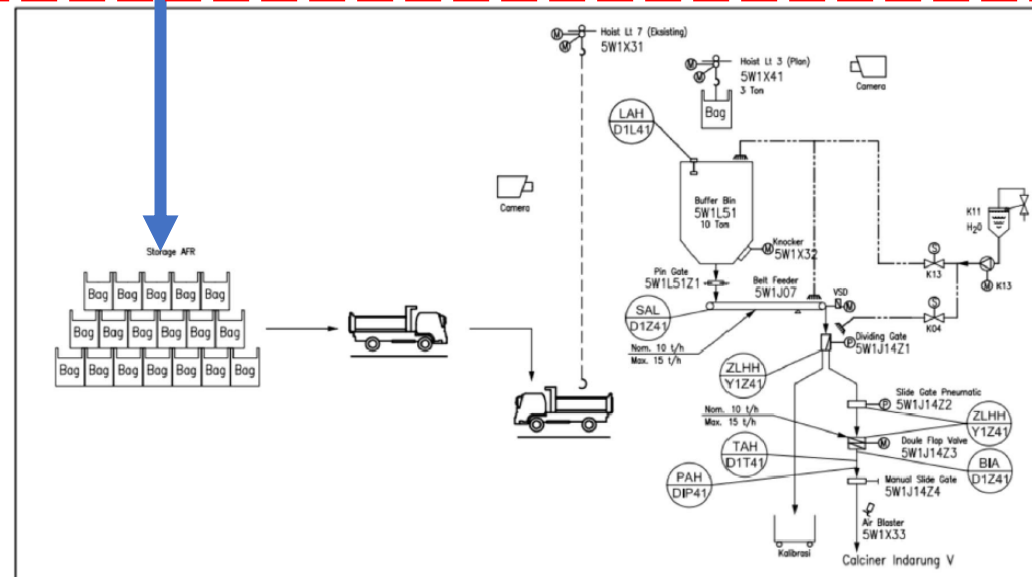
07



08



Sejak 1910





Alternative Fuel utilized by Semen Padang (as per December 2024)



PPST UNAND

Verified

Edit Profile

Change Password



Total Poin

54652.10

poin

Total Setor

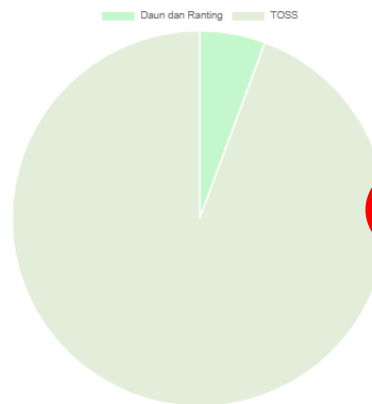
22709.7

kg

0.0

liter

Data Setoran

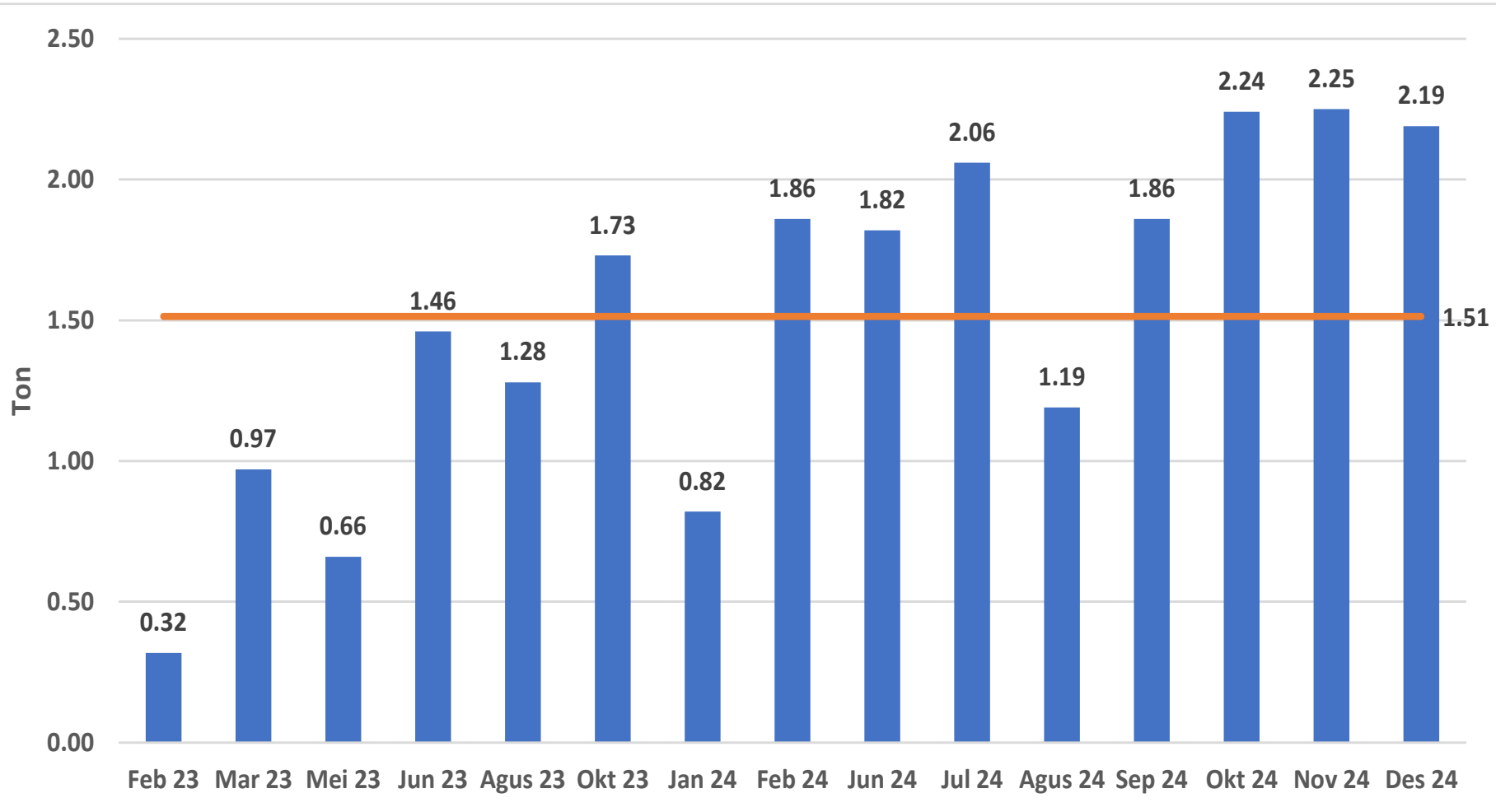


Kategori	Kuantitas	Satuan
Daun dan Ranting	1288.7	Kg
TOSS	21421.0	kg





Alternative Fuel from Unand's TOSS sent to Semen Padang (as per December 2024)





Mini Golds from Semen Padang



News Pendidikan Bisnis Lifestyle Sport Otomotif Video

Olah Sampah Jadi Emas, PPST Unand Berhasil Kumpulkan 53 Kepingan Emas dari Program Nabuang Sarok Semen Padang

Heldi Satria - Minggu, 17 Maret 2024 | 13:26 WIB



<https://www.harianhaluan.com/news/1012176914/olah-sampah-jadi-emas-ppst-unand-berhasil-kumpulkan-53-kepingan-emas-dari-program-nabuang-sarok-semen-padang>





Can TOSS Products
be used for non-industrial
activities?





Biomass Stove Utilization (1)

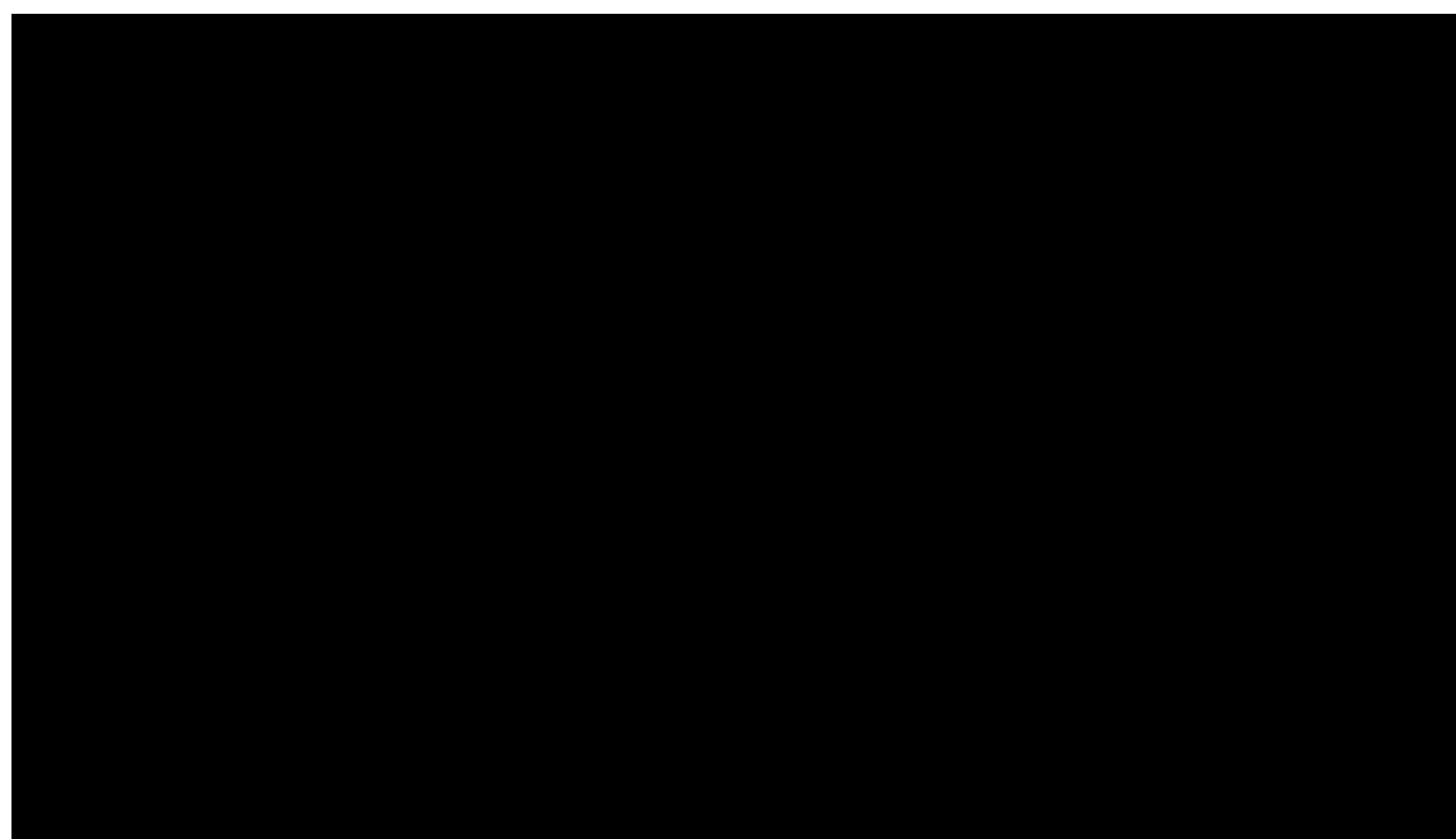
https://youtu.be/zYCOe_qWc04?si=gdX_YZPIC6r99NJF





Biomass Stove Utilization (2)

https://www.youtube.com/watch?v=1DOyz_H5JTY





Biochar dari Tungku Biomassa

Limbah Kayu
Furniture



Cangkang
Kemiri



Cangkang
Kernel Sawit



Tempurung
Kelapa



Pelet Daun
Ranting



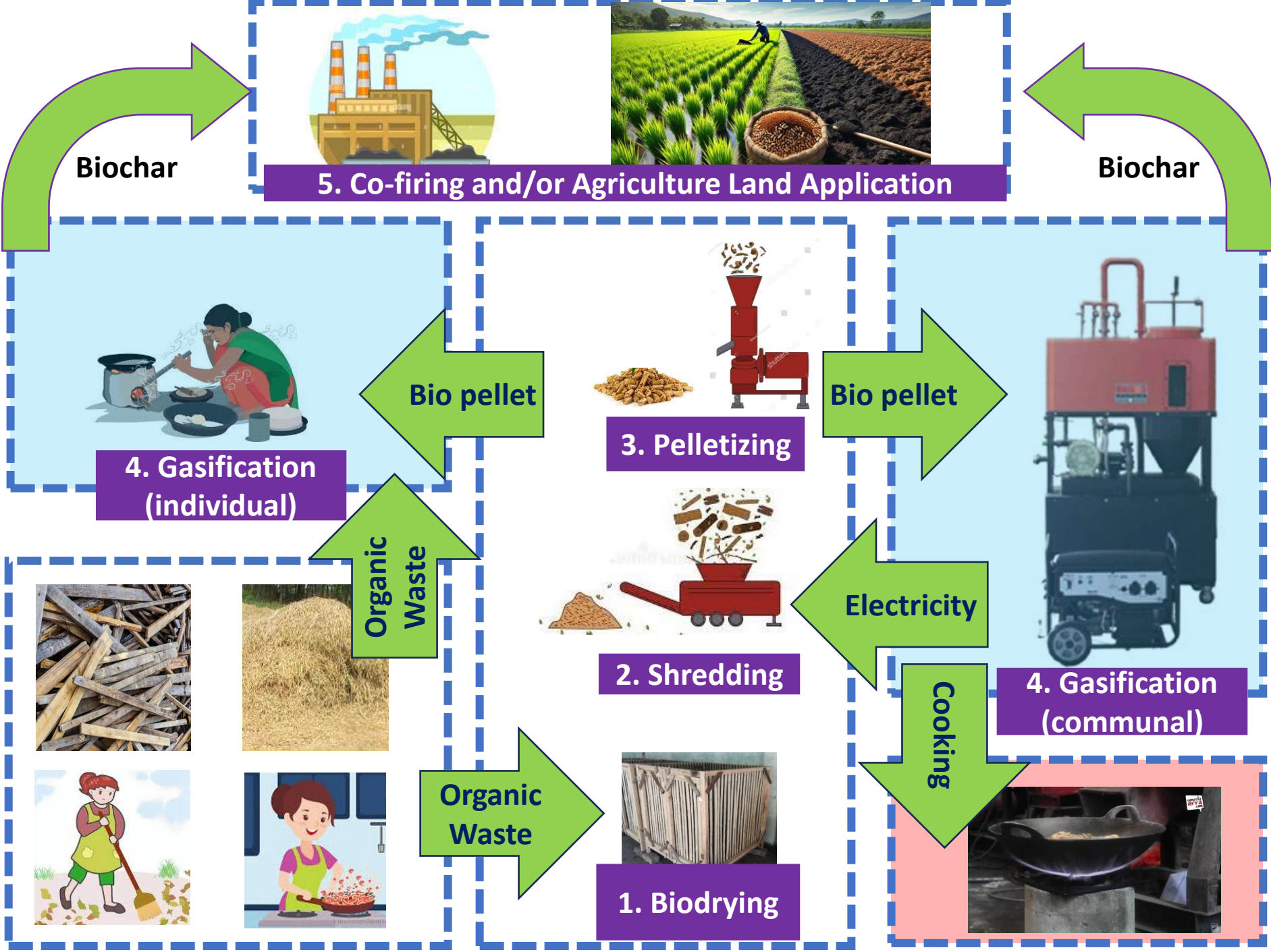
Pelet Daun
Gambir





Some dreams
to share with you...





5



1. Conversion of agricultural waste/residue into solid biofuel (bio-pellets);
2. Utilization of bio-pellets at top lit updraft (TLUD) gasification stoves that generate biochar as a by-product;
3. Utilization of biochar at plantation soil;
4. Evaluate the impact of biochar application on agriculture yield;
5. Evaluate the impact of the prevention of biomass-residue open burning on air quality.

Waste Bank

Industry/
Power Plant

Biochar

Electricity

Gasification

Pelletizing

Biodrying

Biomass Waste



Society
Nearby
Bank
Sampah



Thank you for your attention...

Salam TOSS



“The best among you are those who bring greatest benefits to many others”

Prophet Muhammad (PBUH)