PAEGC/FAO study:

Opportunities for Agri-Food Chains to become Energy-smart

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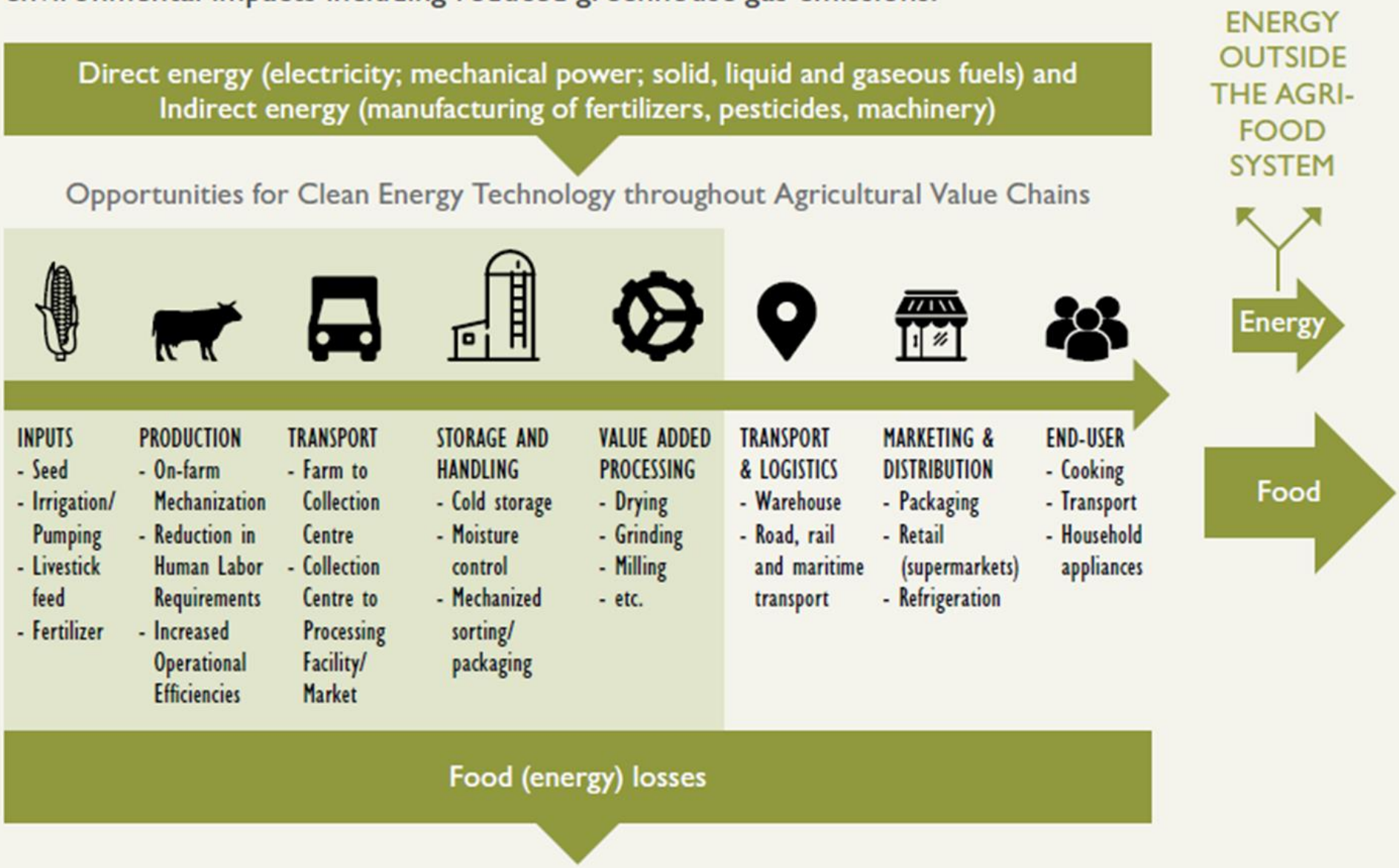
The problem

- Demand for **food** will continue to grow as **population increases**
- Global **food** supply and consumption is responsible for around 1/3 of the total annual **end-use energy**
- The agri-food industry sector is heavily **dependent** on **fossil fuel**
- Around 1/5 of the total **annual global GHG** are emitted by the food sector
- Worldwide, we fail to consume around 1/3 of the food we produce; this corresponds to more than 1/3 of the energy supplied along the food chain.

The good news…

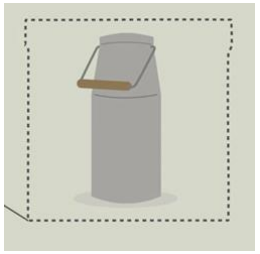
- Vast potential for **energy efficiency** and to replace fossil fuels with **renewable energy** systems along food value chains
- **Benefits include**:
  - Cost saving
  - Saving GHG emissions
  - Increased productivity
  - Improved human health
  - Local employment opportunities
  - Improved livelihoods

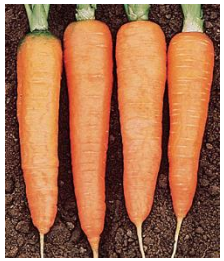
FIGURE 2.1. Food value chains in the agricultural production and processing sectors where clean energy technologies can be applied to provide the desired energy services but with lower environmental impacts including reduced greenhouse gas emissions.



Objective of the study

- Identifies **options for clean energy solutions** along the value chains **milk**, **rice** and **vegetables**



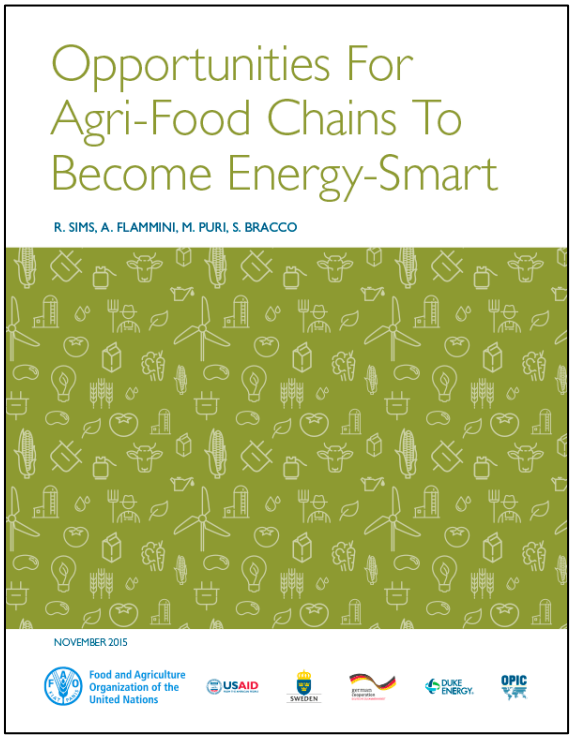




- Assists farmers, food processors, training institutions as well as policy makers and other stakeholder to reduce their dependence on fossil fuel and reduce GHG emissions

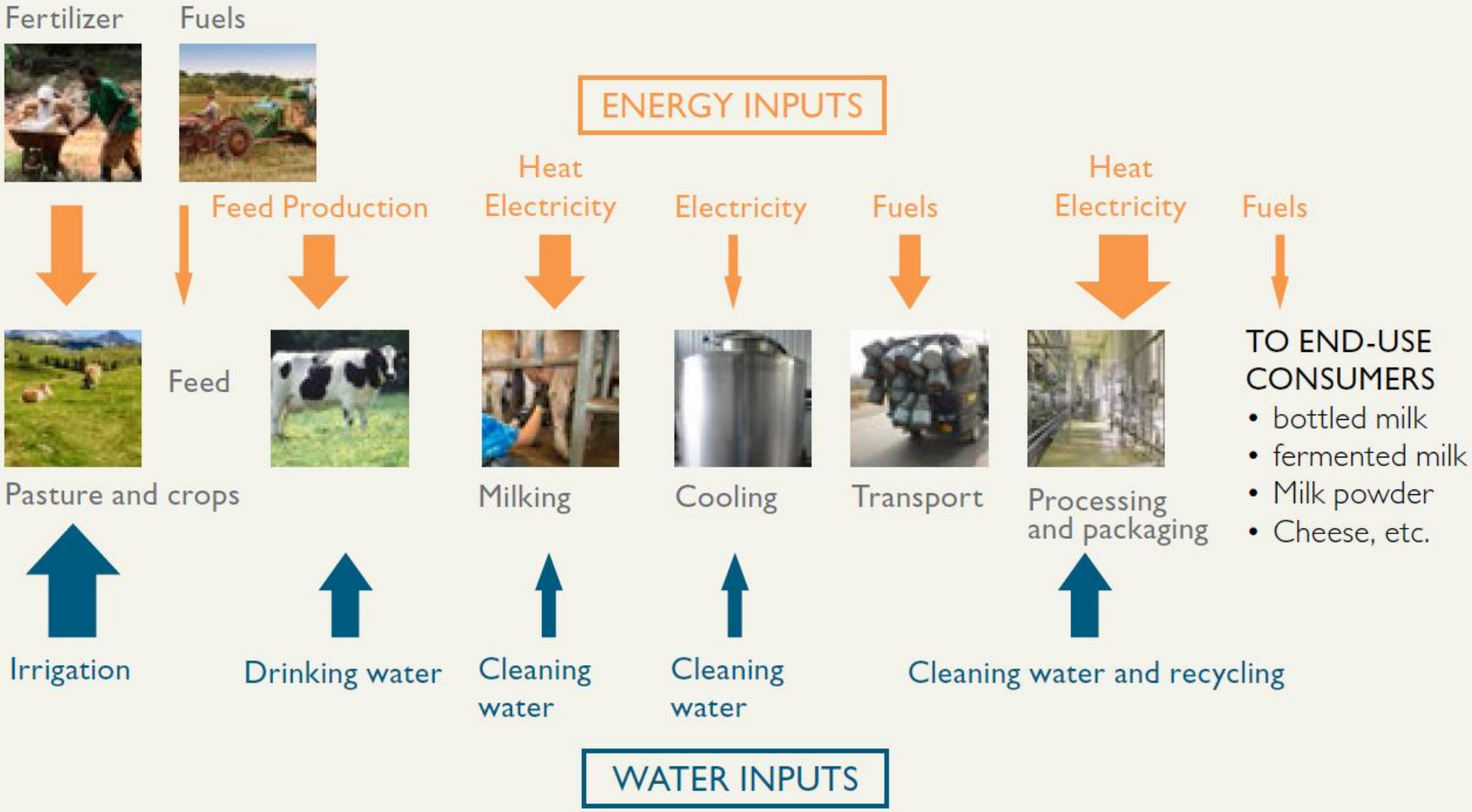
What does the study offer?

- Detailed analysis of the energy **demand** along the three selected value chains
- Assessment of the **potential** for **clean energy solutions** (RE&EE)
- Identification of **priority entry points, steps, and interventions** for introducing the identified clean energy solutions
- **Assessment tools** to a) increase data availability to enable decision making and b) assess the profitability of investments in CES



Findings MILK VALUE CHAIN

Water and Energy Demand within the Milk VC



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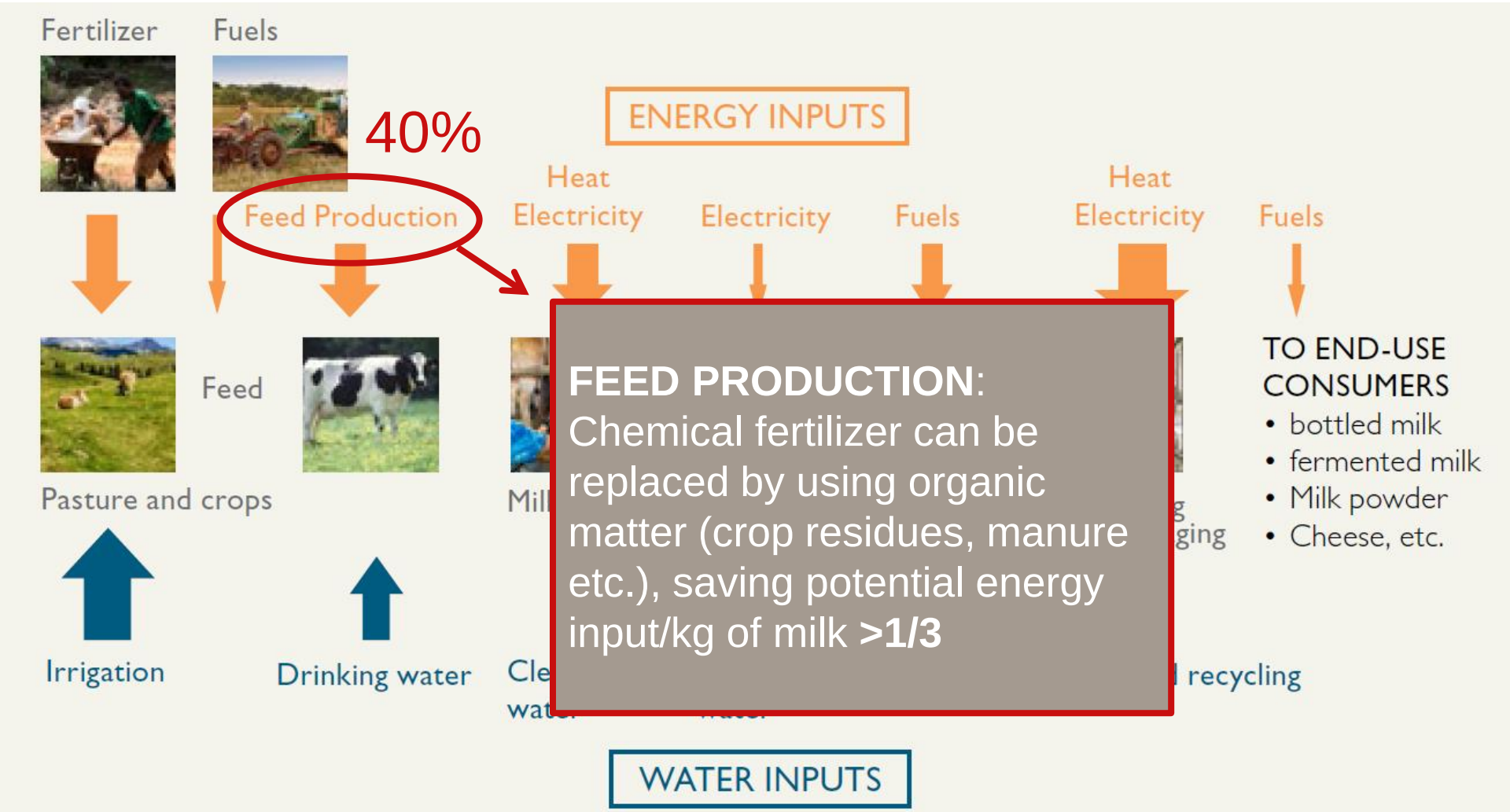
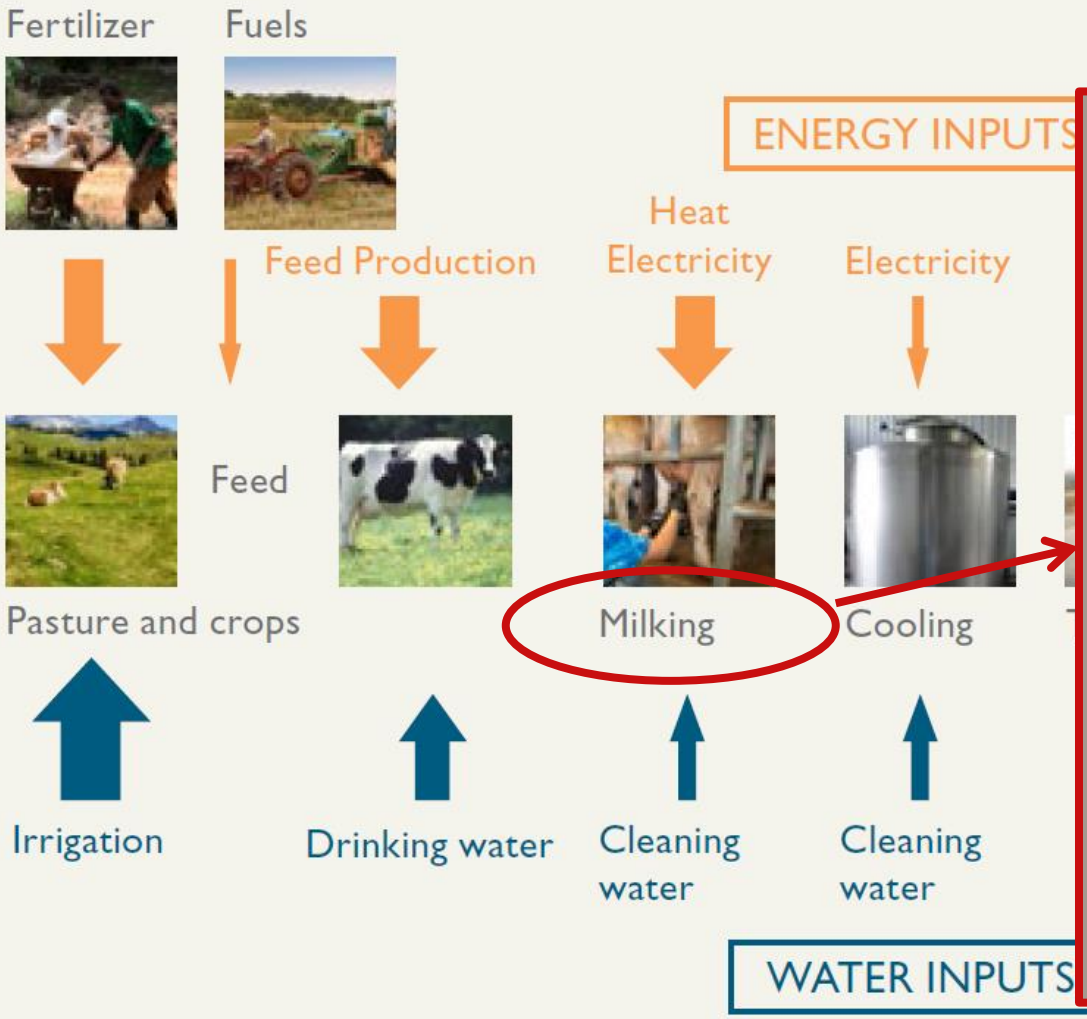


FEED PRODUCTION: Chemical fertilizer can be replaced by using organic matter (crop residues, manure etc.), saving potential energy input/kg of milk **>1/3**

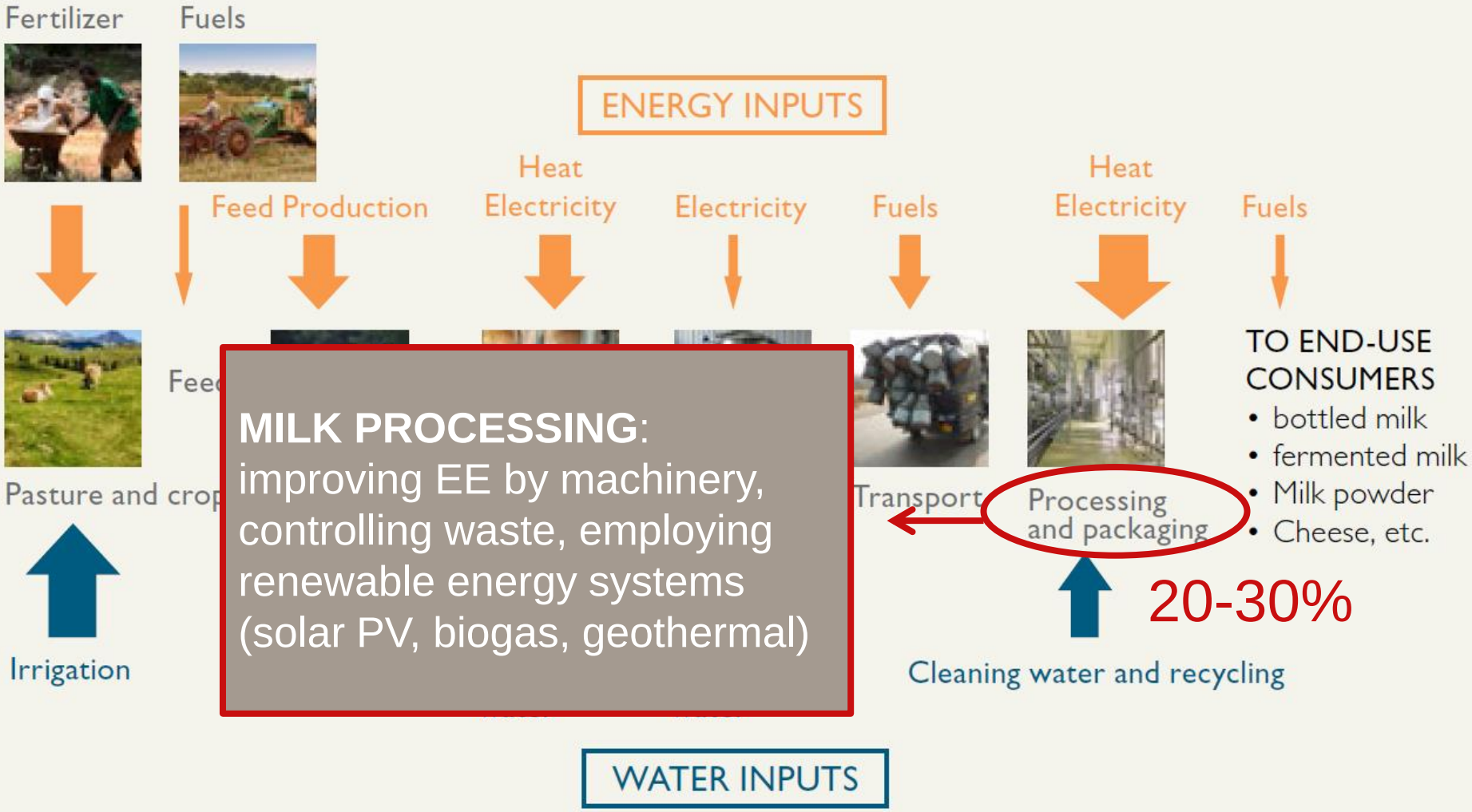
Water and Energy Demand within the Milk VC



MILKING: energy efficiency options

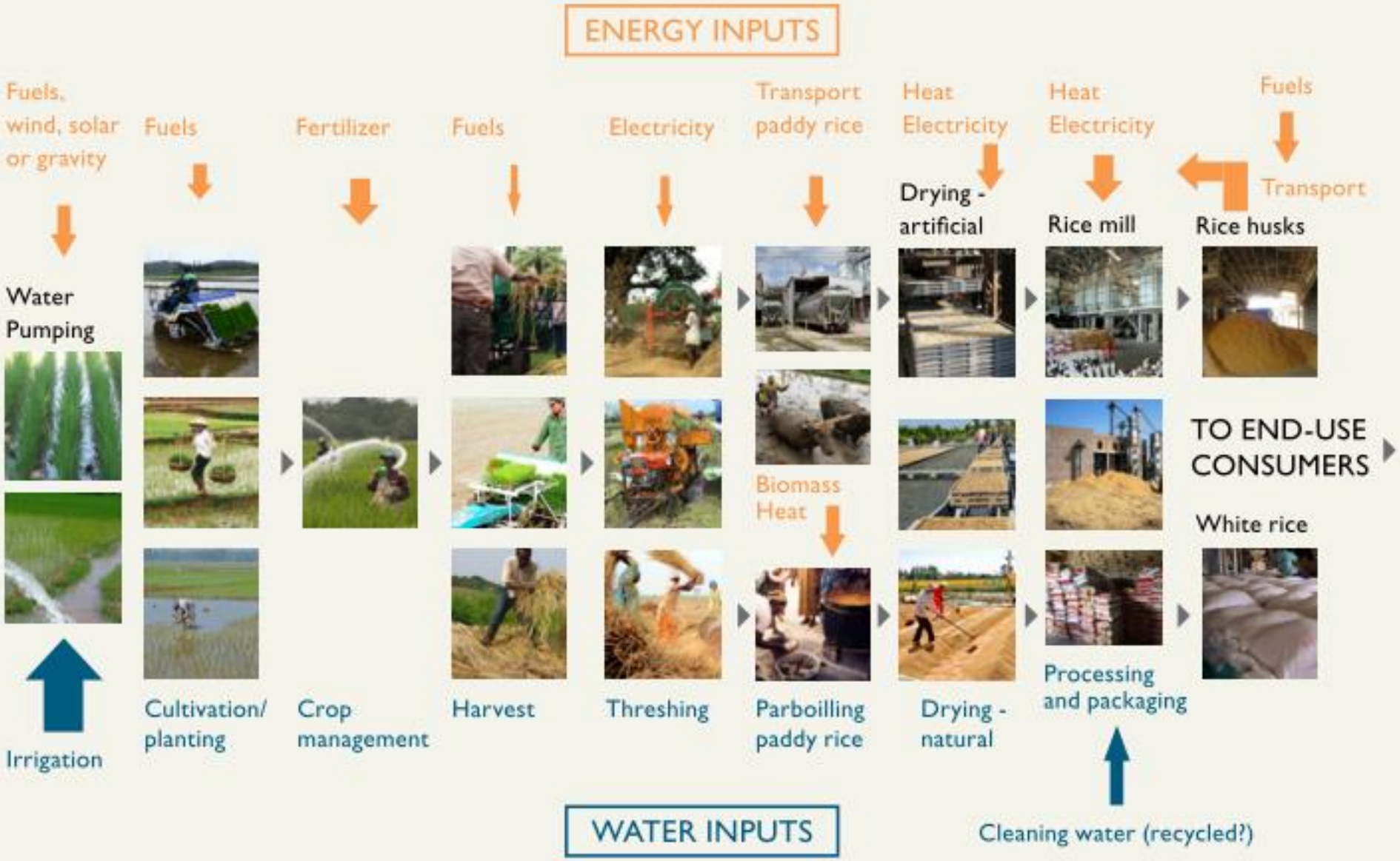
- VSD (electronic speed controller) for vacuum pumps, **80%** saving potential
- pre-cooling (**60%** energy saving)
- refrigeration heat recovery (**20-60%** of heat energy can be recovered)

Water and Energy Demand within the Milk VC

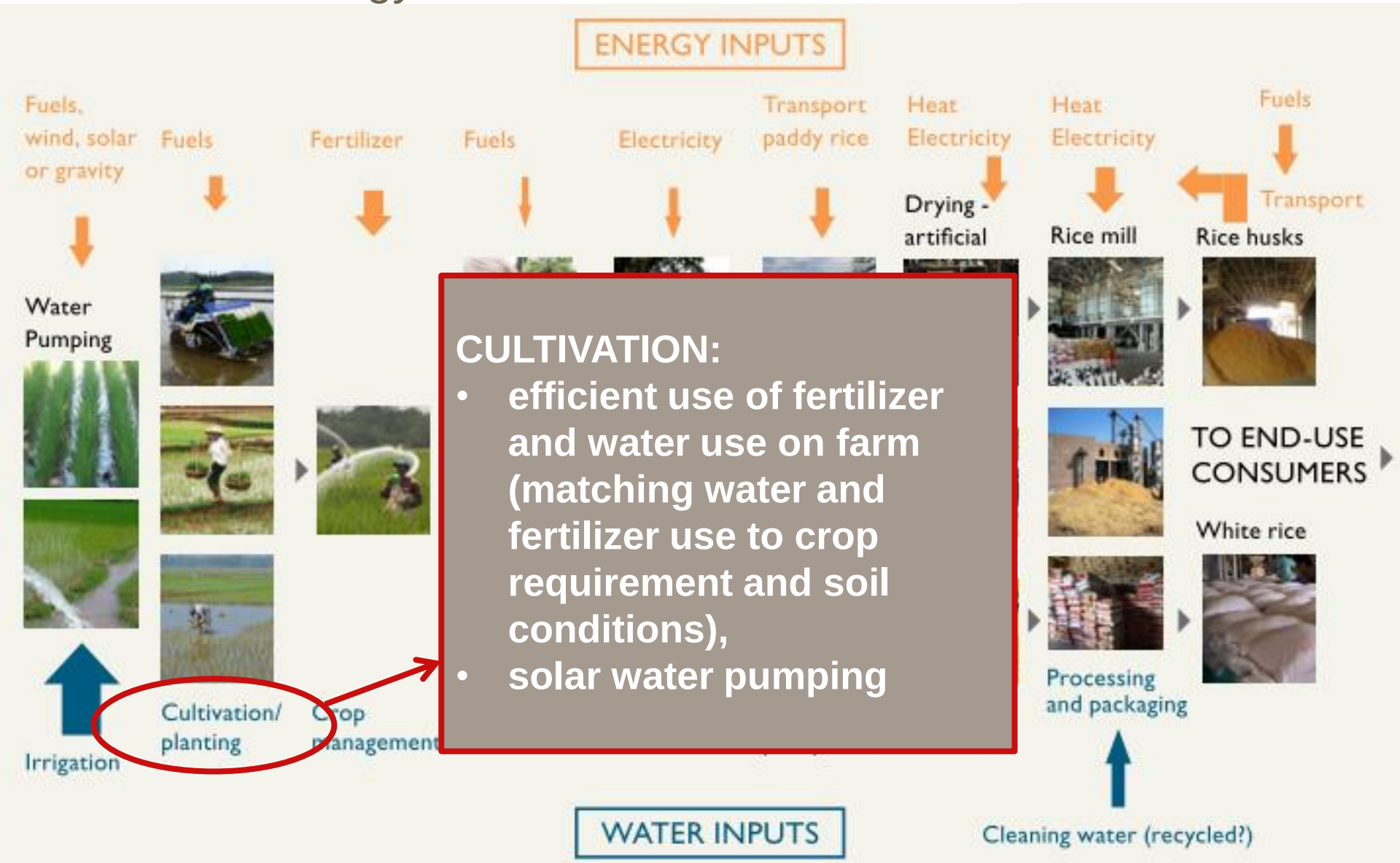


Findings RICE VALUE CHAIN

Water and Energy Demand within the Rice VC



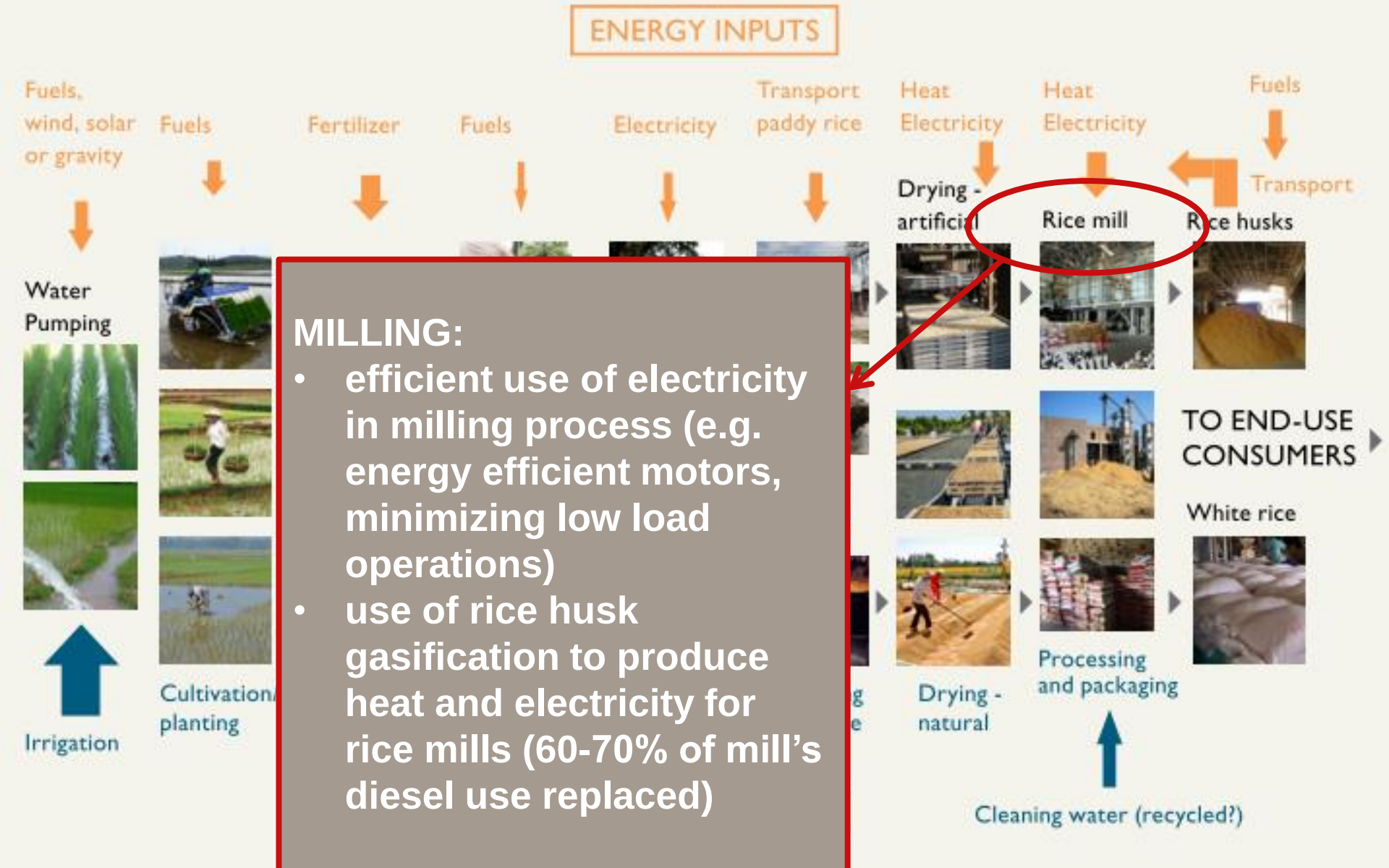
Water and Energy Demand within the Rice VC



CULTIVATION:

- **efficient use of fertilizer and water use on farm (matching water and fertilizer use to crop requirement and soil conditions),**
- **solar water pumping**

Water and Energy Demand within the Rice VC



Conclusion and way forward

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- Opportunities for energy-smart solutions exist and are identified in all three value chains assessed (small and large scale systems)
- Many **co-benefits**, incl. increased productivity, food security, decreased GHG emissions
- **Knowledge gaps**: water use, more specific tools, local context
- **Follow-up study** will assess the three VCs in Tunisia, Philippines, Kenya and Tanzania in more detail, results will be available in Summer 2017

Thank you for your attention!

Download the study here:
http://poweringag.org/docs/opportunities-agri-food-chains-become-energy-smart

Check out the overview article on Energypedia here:
https://energypedia.info/wiki/Opportunities_for_Agri-Food_Chains_to_become_Energy-Smart