MINNESOTA POLLUTION CONTROL AGENCY

Permits for anaerobic digesters

MACPZA Spring Conference

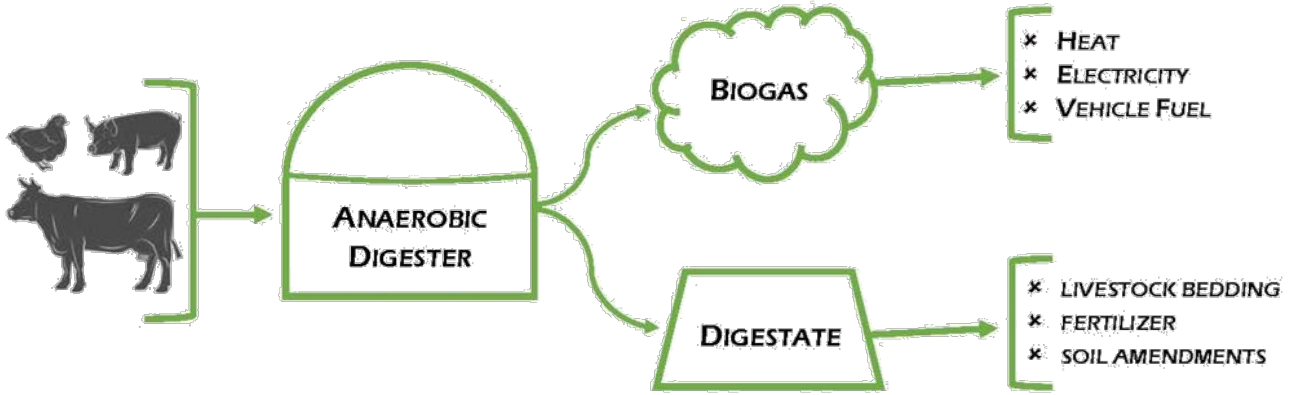
June 2, 2023

Feedlot program

- 15,000 feedlots in MN
- All are subject to state feedlot rules
  - 1,300 have operating permits
- 50 counties delegated to oversee “smaller” sites

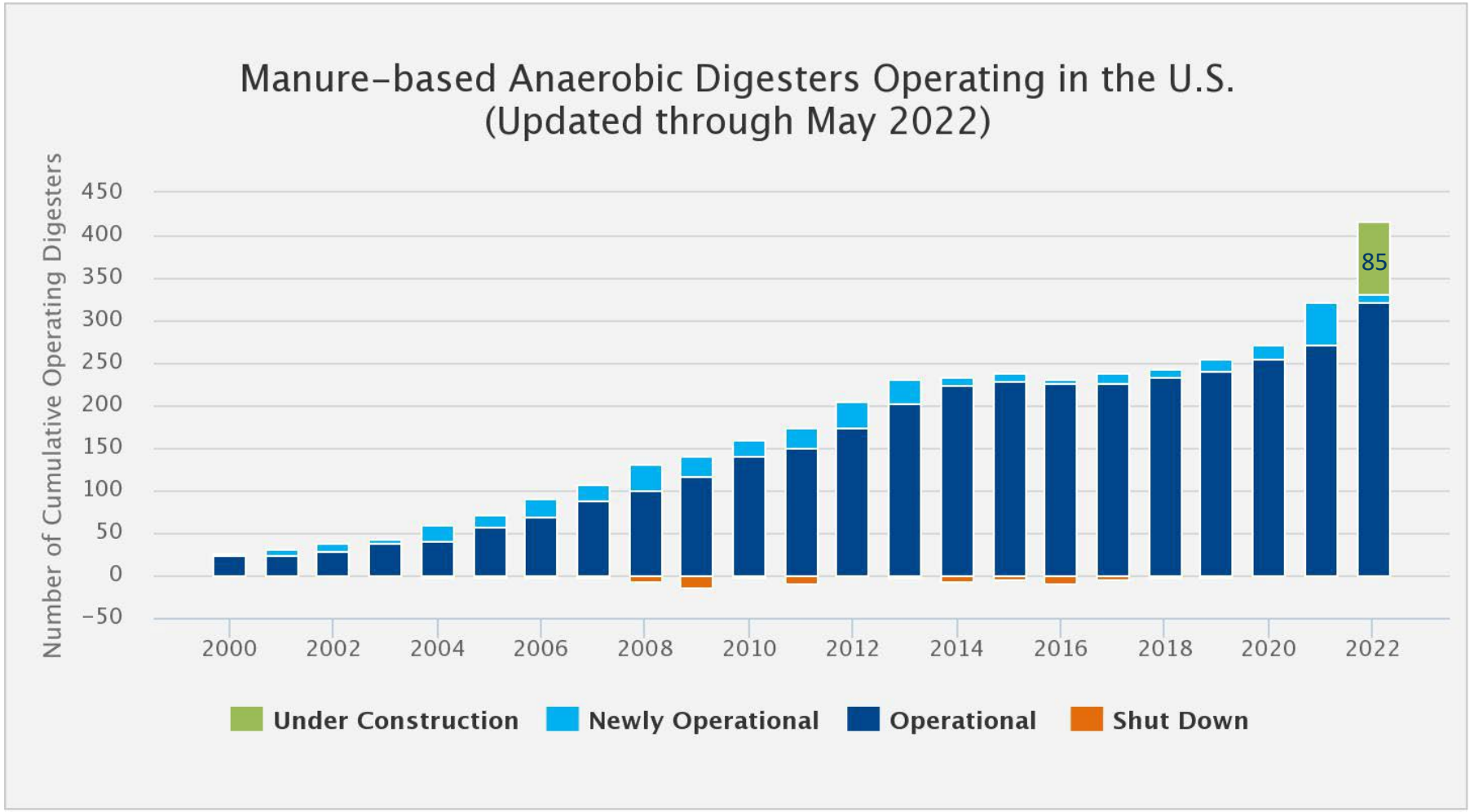
Manure anaerobic digesters

- Not “new”
  - First manure digester in MN installed in late 90’s
- Renewed interest
  - “green energy” credits/mandates
  - Inflation Reduction Act incentives



- New ideas on utilization of biogas
- New ideas on feedstocks for digestion

Manure digester trends



Data from EPA AgSTAR program

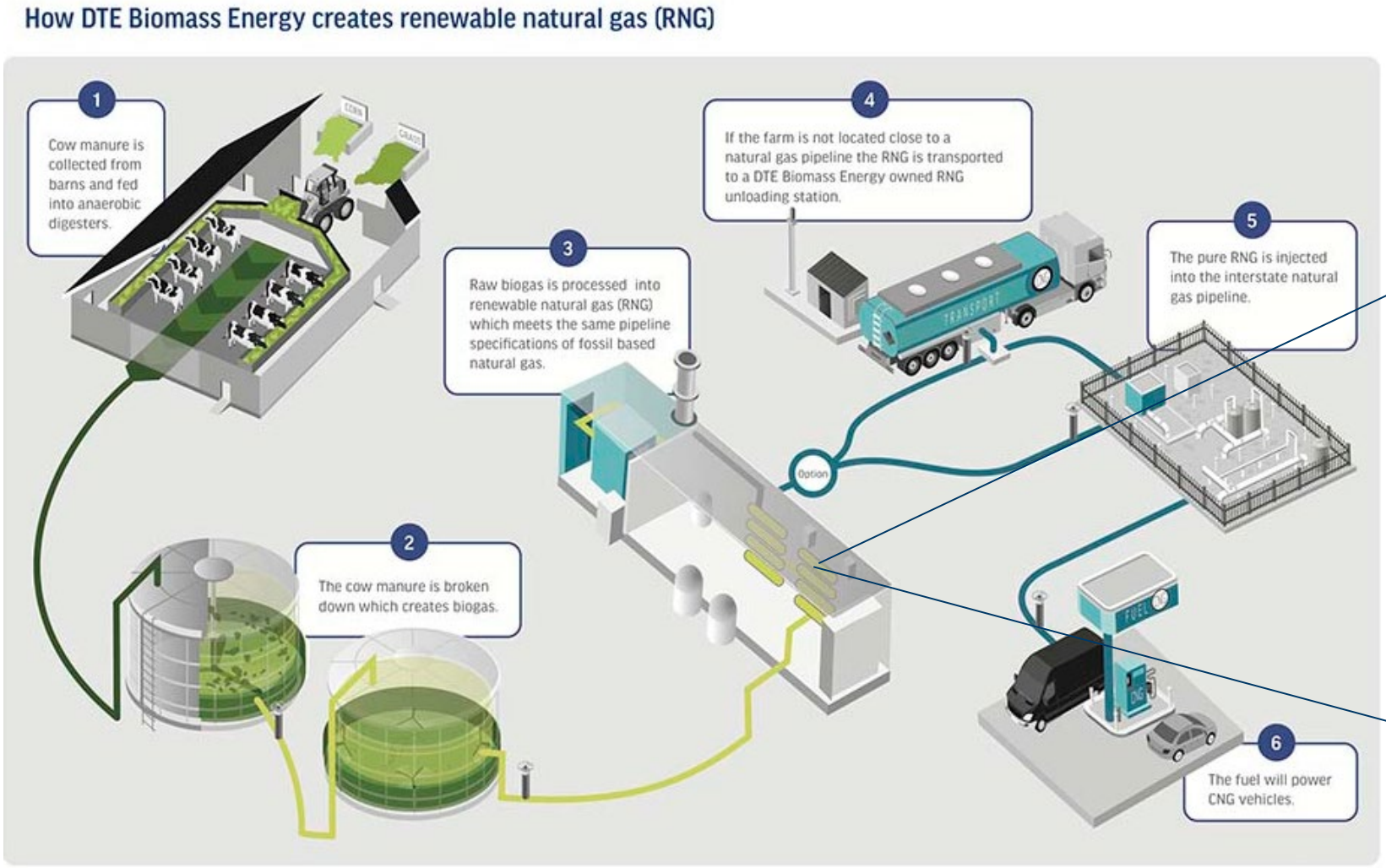
Manure digestion transition

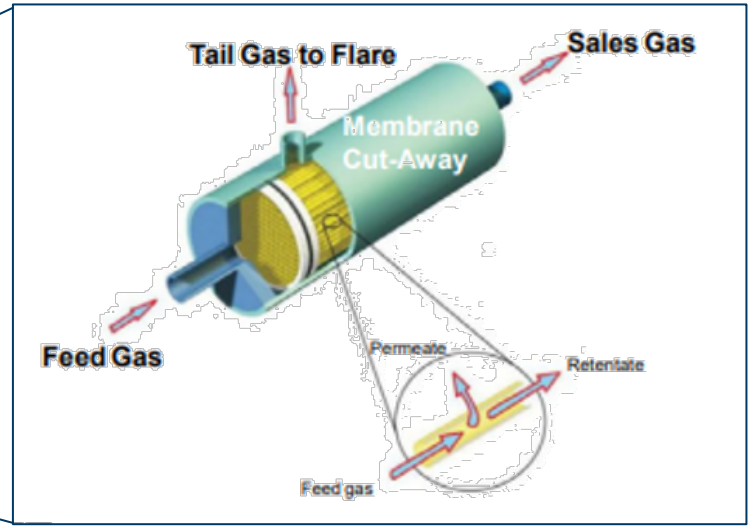
- Previous Model
  - Locate at farm
  - Farm owns/operates digester
  - Digest manure
  - Burn in engine to create electricity
    - 4 in MN right now

- New Model
  - Locate at or near farm(s)
  - Separate entity owns/operates digester
  - Digest manure with other wastes
  - Renewable natural gas (RNG)
    - 4 in MN right now
    - 9 more in planning stages

- New ideas usually do not fit easily into existing regulations

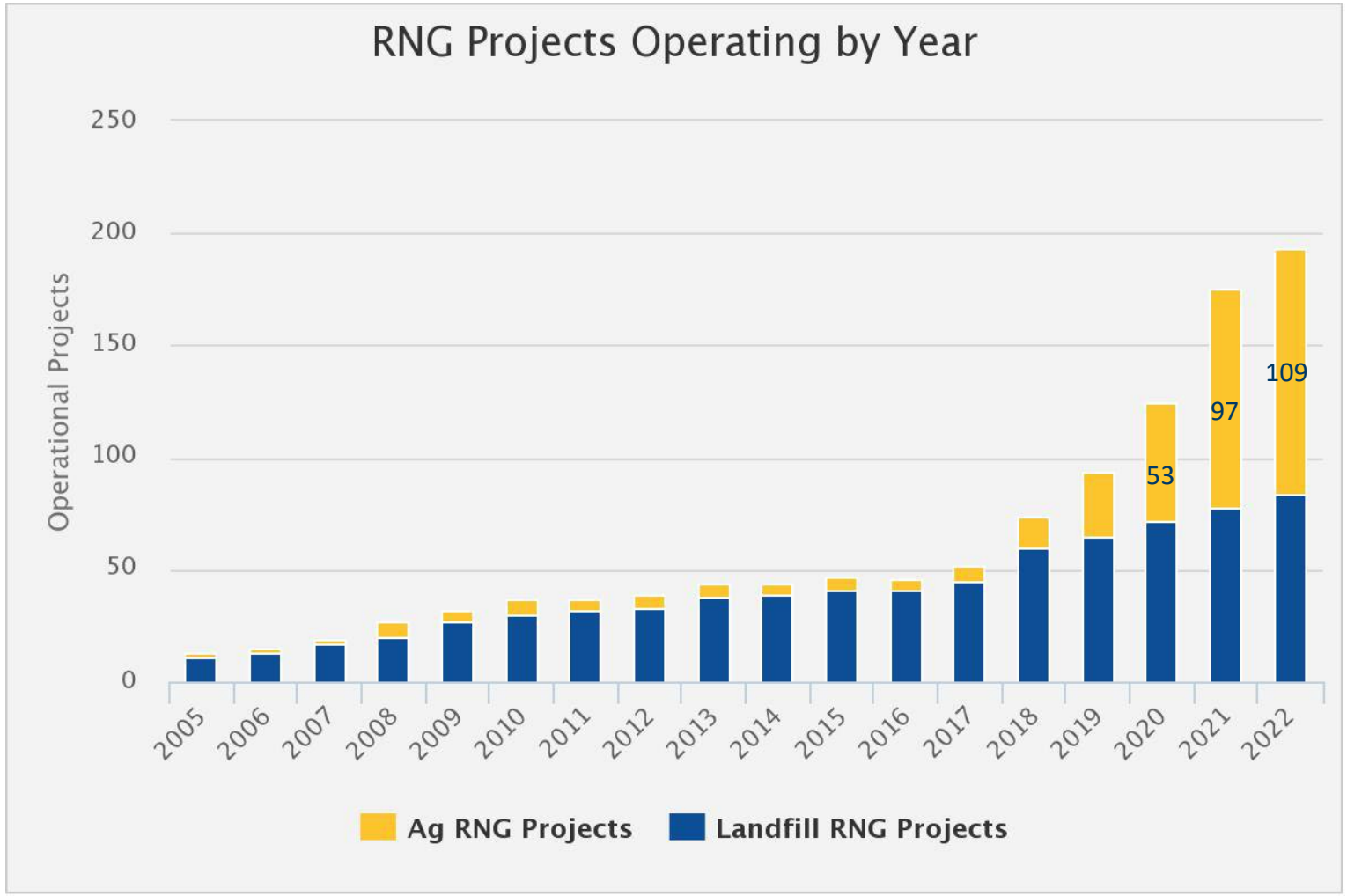
RNG flow diagram





Diagrams from LPELC – DTE presentation

RNG is “IN” right now



Data from EPA

Digestible materials

- All sorts of organic materials
  - Manure
  - Silage or vegetable processing wastes
  - Food processing plant wastes
  - Expired/waste food
  - Residential organics
- Different programs regulate these wastes

Permits

- Permit need generally based on feedstocks
  - One feedstock is easy
    - Manure = feedlots
  - Co-digestion (2+ feedstocks) complicated
    - Feedlot permit
    - Industrial bi-products permit
    - Solid waste permit
    - Tanks permit
  - Air permits may also be required

Single source feedstock (easy)

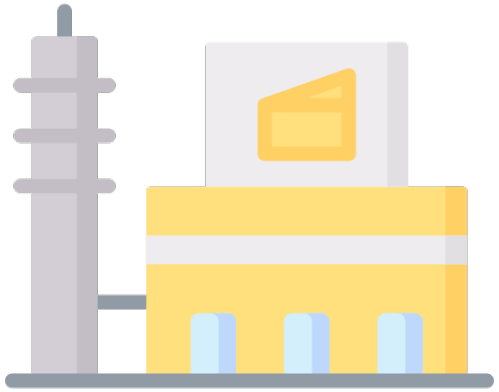
- Manure digester on/directly adjacent to farm
  - Incorporated into the feedlot permit for the farm
    - Even when energy company has ownership of the digester
    - Feedlot assumes responsibility for the digester
  - Digesters permitted just like any other liquid manure storage area
- Manure digester off farm
  - Issued a feedlot permit based on manure storage capacity
    - How many animals would it take to generate that amount of manure

Co-digestion

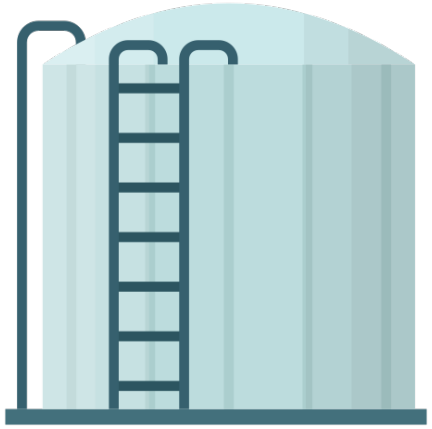
Manure

Arnold Palmer (50/50)

100% manure ??? 100% IBP



IBP



Existing policy allows 10% IBP & 90% manure to be considered manure

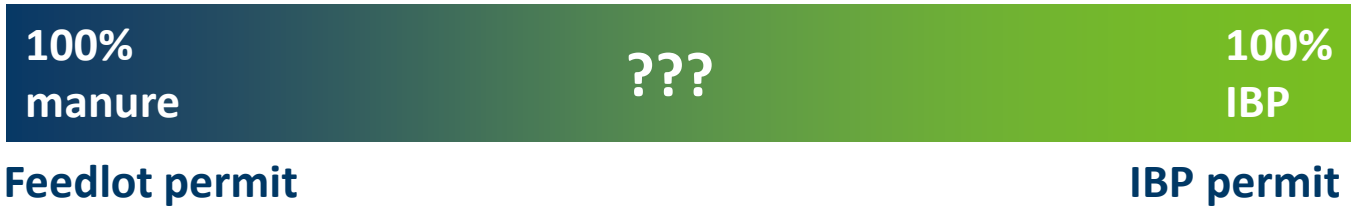
Example co-digestion proposal

Turkey Litter	10-15%	Slaughter Plant Sludge (DAF)	5%
Dairy Manure	10-50%	Delactosed permeate	0-5%
Hog manure	10-20%	Rapeseed oil	0-1%
Maize	0-5%	Brewery spent grain	0-1%
Straw Pellets	0-5%	Fat - vegetable	0-5%
Corn Silage	0-5%	Food Waste	0-5%
Wheatstraw	0-5%	Coffee Grounds	0-1%
Process Water	5-10%	Stillage	5-10%

Permits for co-digestion

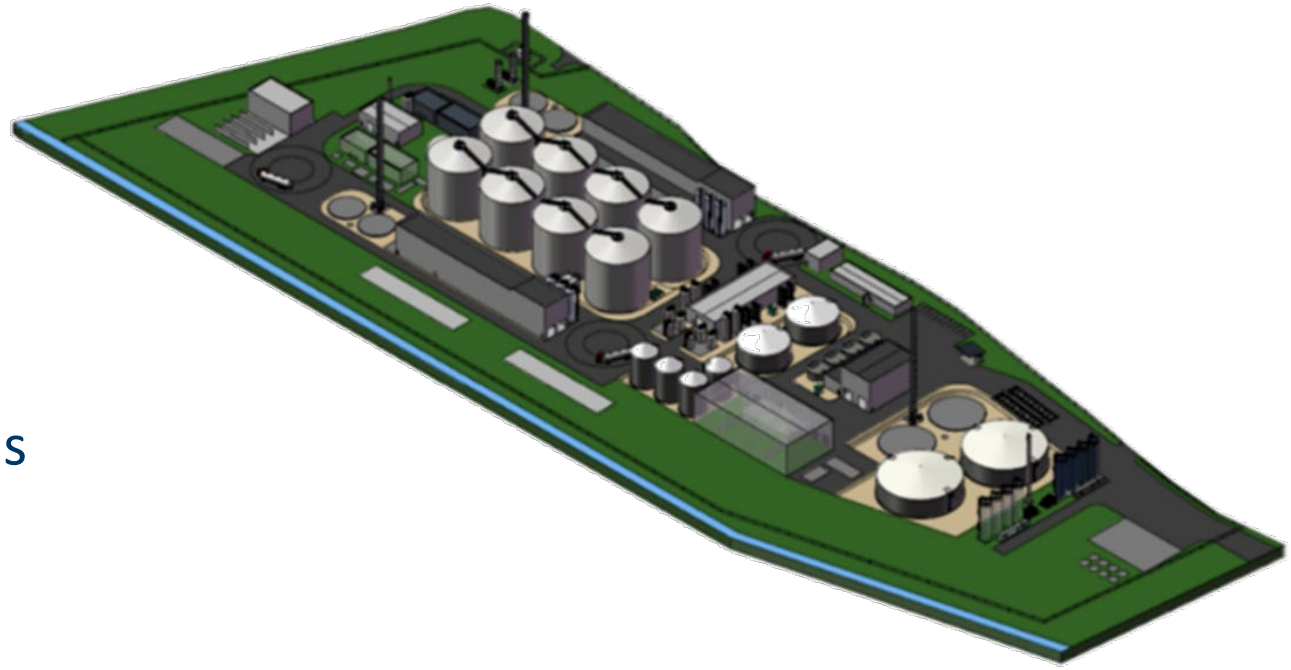
- Still a fluid situation but, generally ……, multiple permits will be needed
  - Feedstock tanks/reception areas
    - Manure = feedlot permit
    - Other materials = tanks program registration/permit as required
  - Digester tanks and post digestion storage tanks
    - Depends on the mix of feedstocks – case by case

6 in planning stages now



Community co-digester

- Centralized facility
  - 2 proposed sites right now
  - Danish company
- Scheduled pickup from farms
  - Tanker truck
  - Small day pit
- Return of digested material to farms
  - Existing manure storage basin
  - Co-digested material



Community co-digester benefits

- Potential Benefits (provided by proposer)
  - More precise nutrient application
    - Ability to better balance N & P to crop needs – “custom blend” returned to farm
  - Lower application costs
    - Higher N content returned = lower app rates = fewer trips to fields
  - Increased storage capacity
    - Higher N content returned = less volume to store
  - Proposing to cover long term storage at farms (including existing)
    - Less odor, rainfall dilution, ammonia loss to atmosphere

Early in the process
More ground-truthing needed

Land application of co-digestate

- Manure in digester = manure rules apply
- IBP in digester = IBP rules apply
- Issues for livestock farmers who take IBP from digester
  - Existing liquid manure storage must be permitted for IBP storage
    - 3 ft freeboard (1 ft for manure storage)
  - Type 4 operator (special license) needed for land application
  - Different land application setbacks
  - Increased reporting requirements
    - Even small feedlots (only large feedlots currently submit manure application annual reports)
  - Spray irrigation – very challenging/comprehensive set of requirements

General guidance for counties

- Ask questions about the type and amount of feedstocks
  - If they say “food waste” ask more questions about what they mean by “food waste”
    - Might be solid waste (SSOM) – might be IBP
- Let MPCA know about digester proposals before gov’t approvals
  - Contact program that corresponds to the major feedstock
    - ie. 60% manure – contact feedlot program (me)
  - MPCA can verify environmental review is not needed
    - Relatively unknown that EAW’s might be required simply because of a digester project
  - Co-digestion questions/issues/decisions will take longer than single feedstock digesters

Summary

- Challenges for regulation
  - Co-digestion
    - Multiple programs involved
  - Each project is unique
    - Feedstock ratios are approximate depending on material availability
    - Trying to develop some guidelines based on feedstock mixture - likely not going to cover all situations
- Keep MPCA informed of projects in your county
- More to come as projects advance from planning to permit application

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Questions?

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