

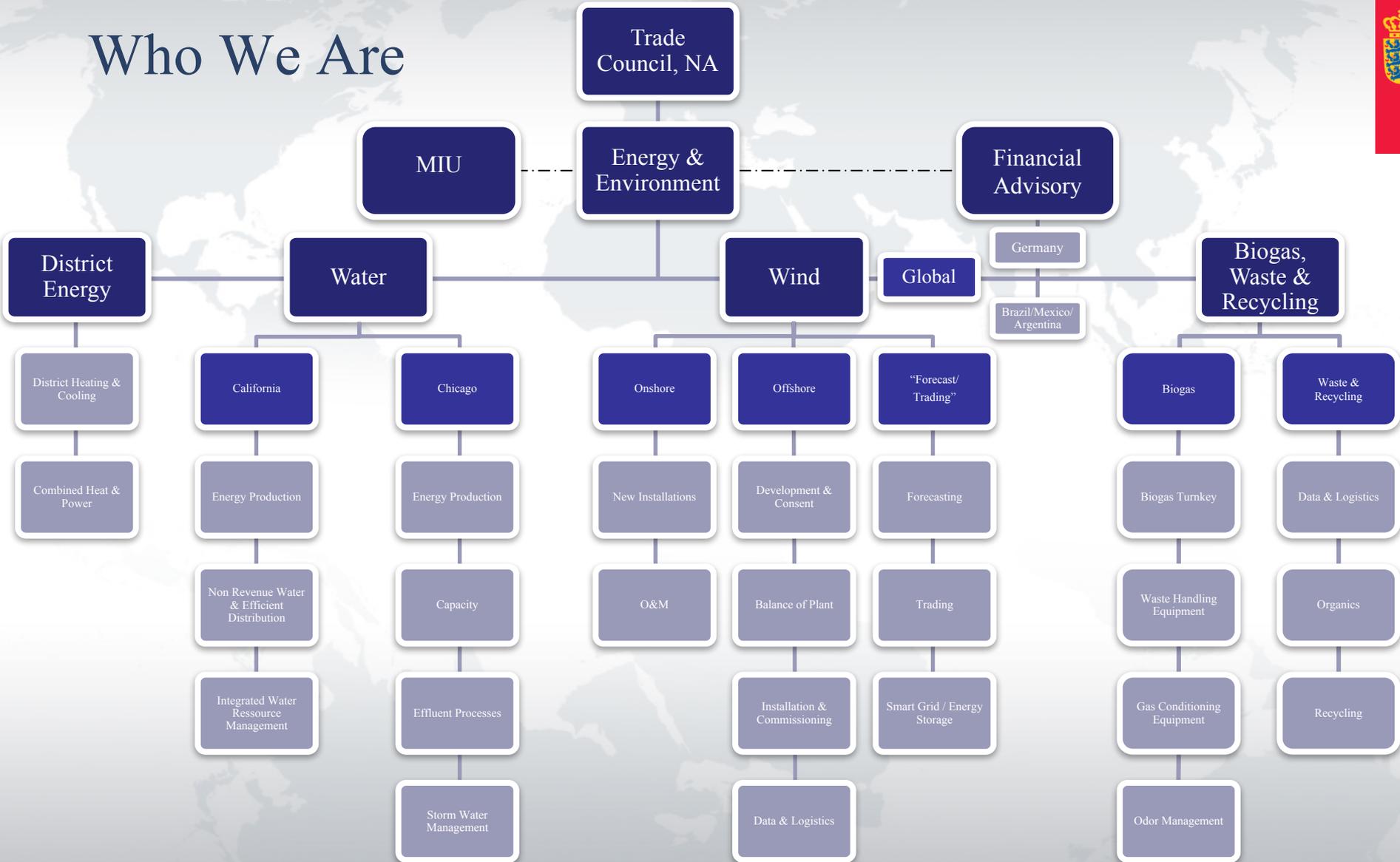


Applying Danish Best Practices & Core Competencies to California's Sustainable Bioresource Economy

November 1, 2017



Who We Are



So, Where is Denmark?



Trigger Event – The OPEC Oil Crisis in 1973

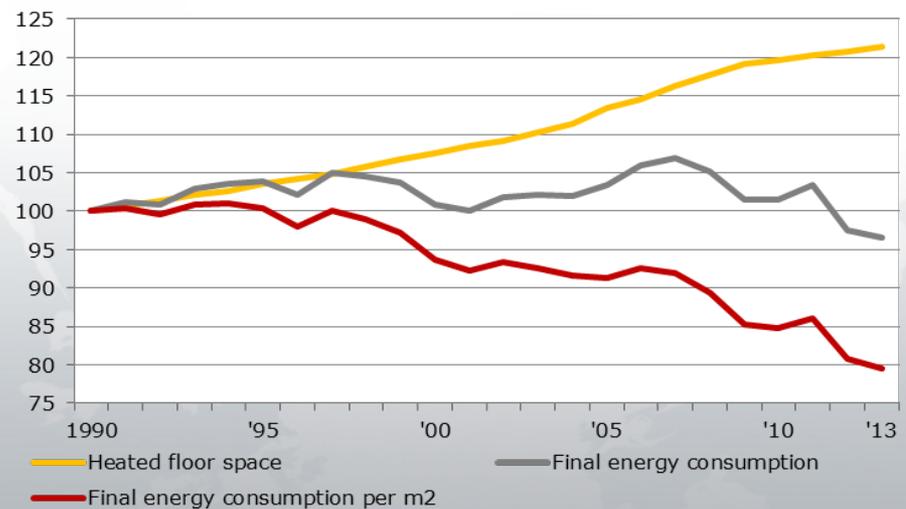
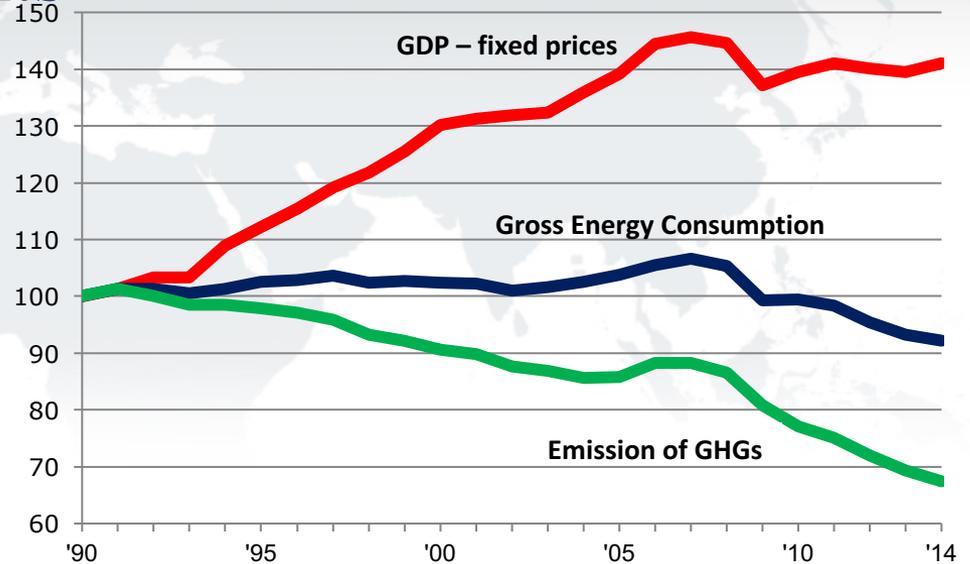
- 90% of the energy consumption depended on imported oil
- Oil prices doubled within one year
- Heavy restraints on oil consumption
- Trade deficit!



Danish Green Highlights

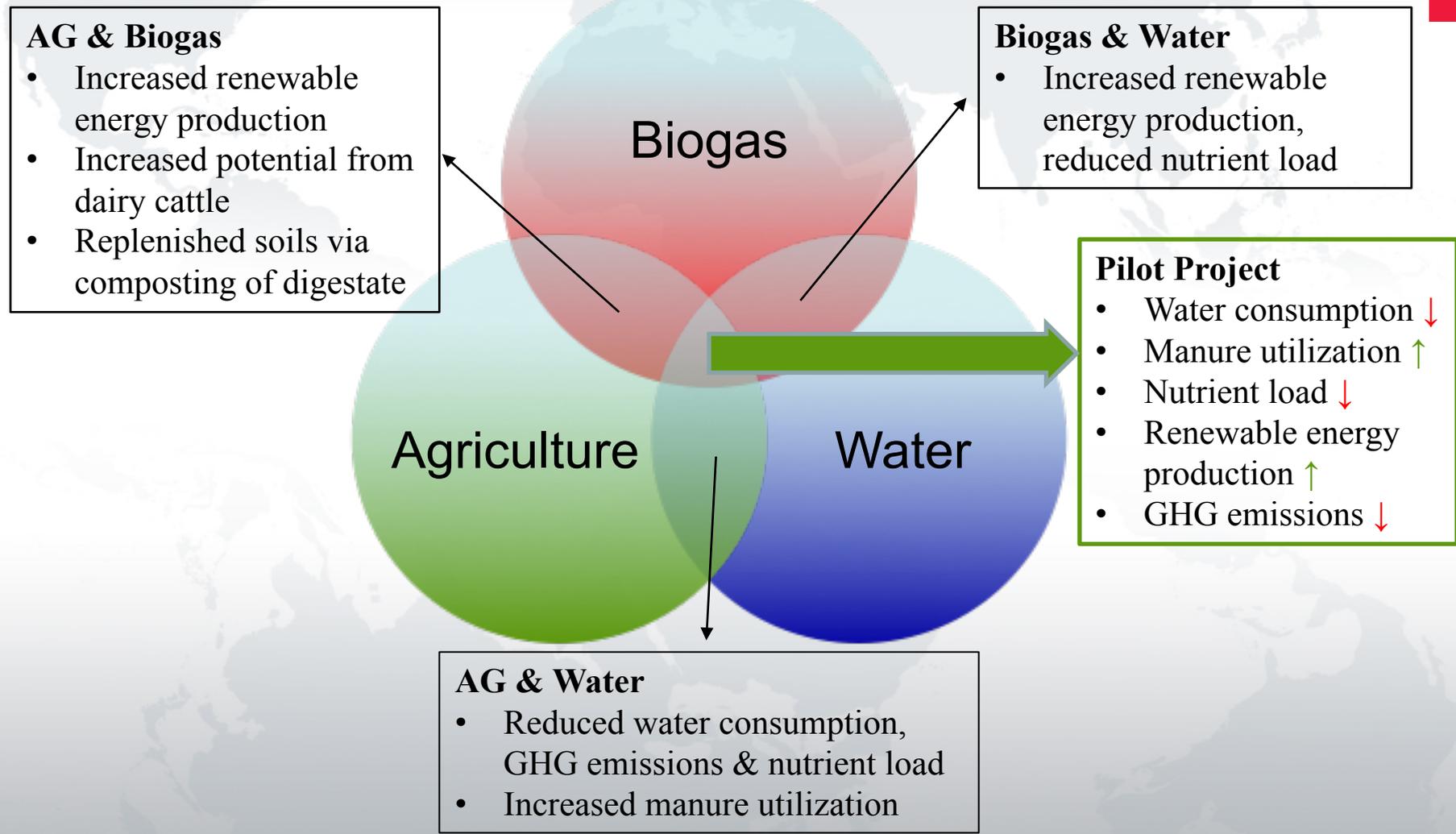
- Energy consumption per GDP-unit is lower than in any other EU-country
- The world's highest share of new renewables (non-hydro) in electricity generation – 56% in 2015
- Very high degree of energy security
- World leader in advanced energy technologies – district heating and CHP, wind, biomass, biogas, energy saving technologies

Danish Energy Agency





Pilot Project to Showcase Combined Danish & CA Best Dairy Practices





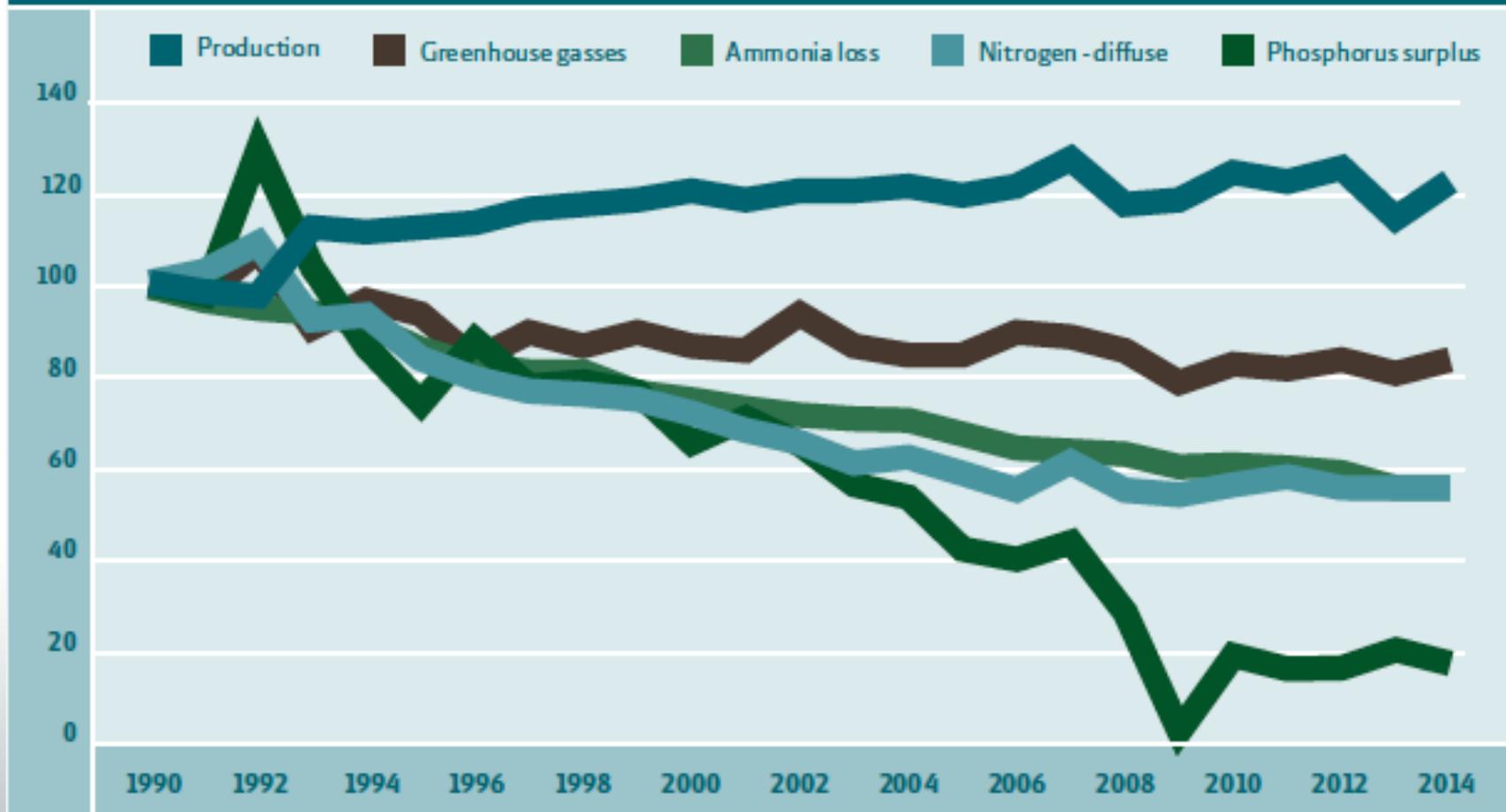
Agriculture Highlights

- 61% of Denmark is cultivated
- Farms are large: average size of 173 acres; more than 20% of farms exceed 250 acres
- Crops with a large proportion livestock, dairy and pigs
- Sustainable Growth: From 1990 to 2014, value of ag production grew by 22% at the same time that nitrogen loss to coast water was cut by 43%
- Phosphorus excess fell by 83%; GHG emissions fell by 16% driven by innovations, new technologies and practices
- Straw is a feedstock for bio-ethanol production or heating; no longer a waste product
- High utilization of manure for field application & corresponding lowering of mineral fertilizer application: Nutrient load ↓ Manure utilization ↑
Mineral fertilizer ↓
- Danish milk has the lowest CO₂ load in the EU due to high efficiency and high utilization of N in the fields

Higher Production Levels Concurrent with Huge Positive Environment Impact



Development in production and environmental impact, index 1990=100



Source: Statistic Denmark.

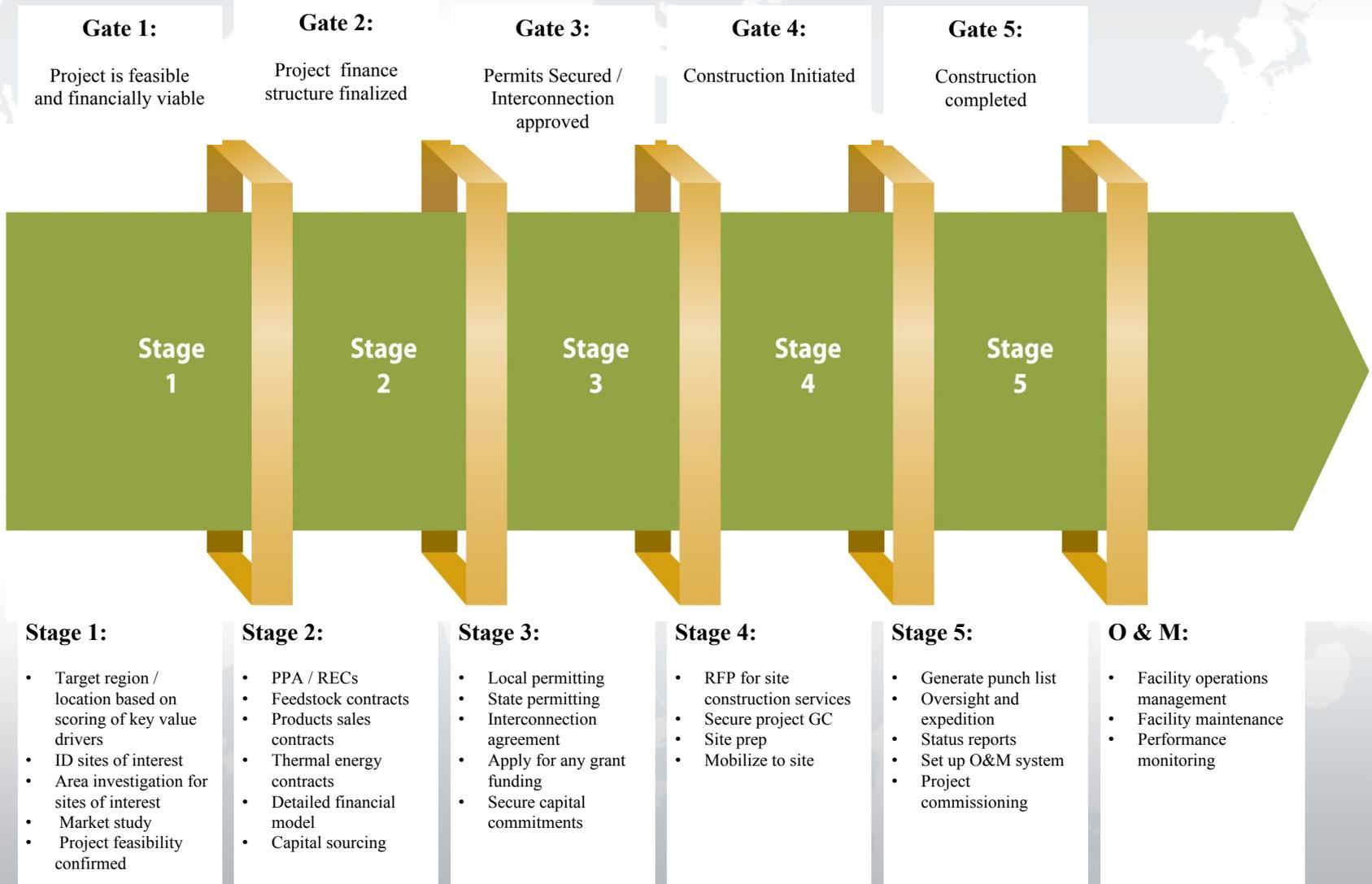
State of the Art Technology for Sustainable Agriculture and Food Production

- Scarce resources and sensitive supply of clean ground water have contributed to a demanding environment for agricultural and food production
- The conditions are also reflected in strict regulations regarding environmental impact
- Resource efficiency is ingrained in the DNA of modern Danish agriculture
- In a global market which, increasingly emphasizes sustainable production, this efficiently gives Danish agriculture know-how an ability to contribute to similar challenges in California and other parts of the U.S.





Stage Gate Approach



Next Steps

- We are here to LISTEN and learn to determine how we can help achieve common goals
- We are looking for partners and local stakeholder cooperation to formulate a viable action plan
- We envision a delegation trip to Denmark of key stakeholders to see and experience Danish solutions to common issues facing California with respect to waste and manure management, ground water protection, nutrient management, GHG mitigation
- Sustainable practices and economic prosperity are not mutually exclusive goals – they are positively correlated in Denmark, and we look forward to sharing our experience and contributing to California’s near and long term goals





Thank You

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