AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

The Irish Agriculture and Food Development Authority

Scenarios For Agricultural GHGs

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Overview

- Look at **Business as Usual** projections and **6 scenarios** to **2030**
- Scenarios **based on cow numbers might evolve** in the dairy and beef herds
- Using **FAPRI-Ireland models** look at impact on:
    1. **Total Cattle** Population
    2. **GHG** emissions (excluding mitigation actions)
    3. **Milk and Beef production** volumes
- **GHG Mitigation:** Based on Teagasc MACC modelling
    - Calculate feasible mitigation under each scenario analysed

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FAPRI-Ireland Model

- **Economic model** of the Irish agricultural sector
  - With related GHG emissions model
- Generates **projections** to a **ten year horizon (i.e. to 2030)**
  - **Agricultural activity** levels (animal numbers, crops areas & yields)
  - **Input Use** (Feed, Chemical Fertilisers)
  - Commodity **supply and use** balances (Production, Imports, Exports, Domestic Use)
  - **Economic indicators** such as prices, output value and sectoral income levels
- Linked to **EU and world** agricultural commodity **markets** & ESRI (macro)
- Used to model impact of
  - **agricultural policy** and **trade policy** developments
  - **agricultural activity** on **GHG emissions** (and ammonia emissions)

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Projected Dairy & Beef Herd growth rates

- **Scenario A**
  - **best assessment** of future assuming policy doesn't change
  - **policy** held **constant** (CAP, Trade Policy, Environmental Policy)
  - **market prices** and **production costs** determine **size of Irish dairy and beef cow herds**
- **Scenario A+**
  - (previously prepared for the EPA)
  - implication of **higher beef and dairy cow herds numbers** than under **Scenario A**
- **Scenarios B to E:**
  - alter economic incentives
  - explore implications of **hypothetical GHG emissions reduction targets**
- **Many ways to skin a cat**
  - alternative combinations of beef and dairy cow numbers can deliver reductions required
  - nothing "unique" (or preferred) about the pathways shown in scenarios C and E

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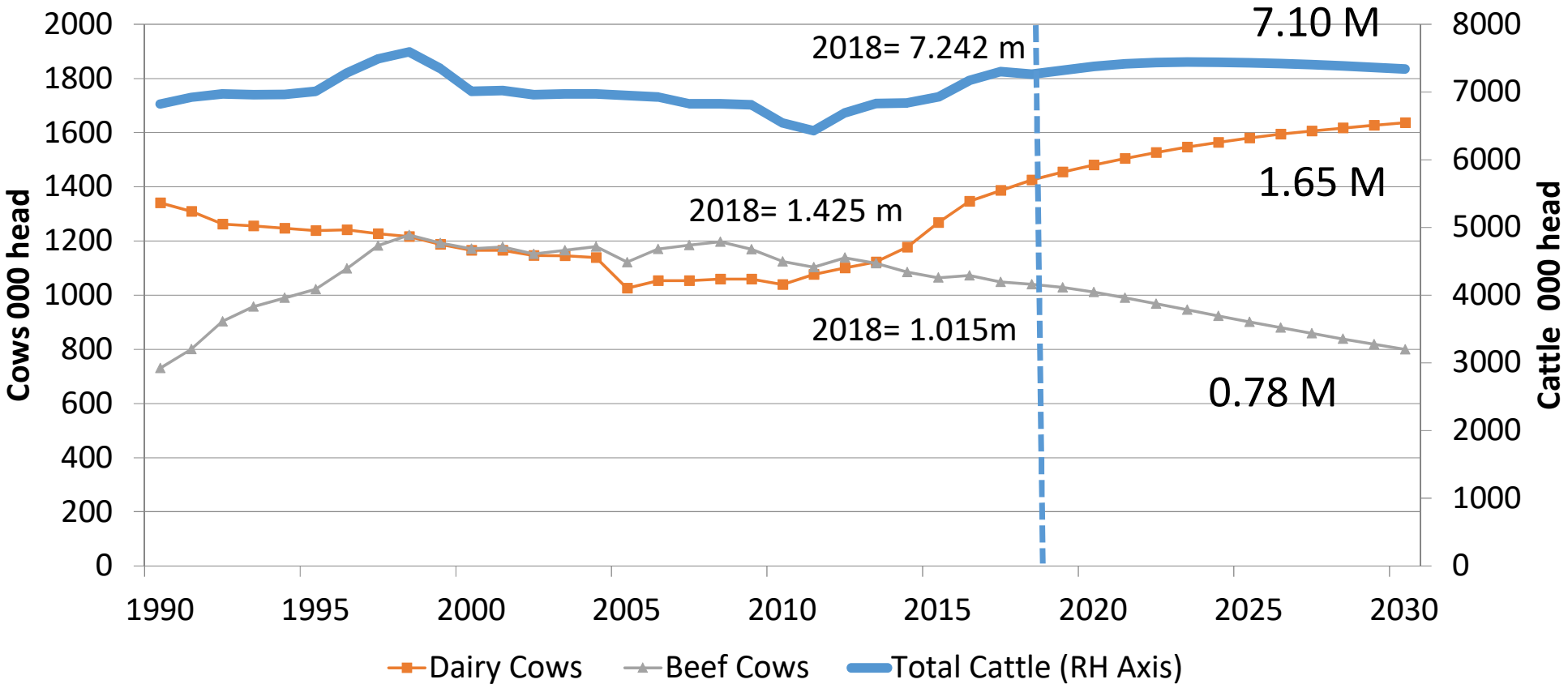
“All models are wrong, but some are useful”

George E.P. Box

- Objectives are to illustrate
  1. what **reductions in GHG emissions** the **measures in Ag Climatise can feasibly deliver** at different levels of agricultural activity
  2. **changes in ag. activity required** as GHG reduction targets increase
- We are **not designing policy actions** to deliver these results
  - Identifying policies to deliver these results would need a **separate discussion**

Business as Usual & Scenario A.



Source: FAPRI-Ireland Model

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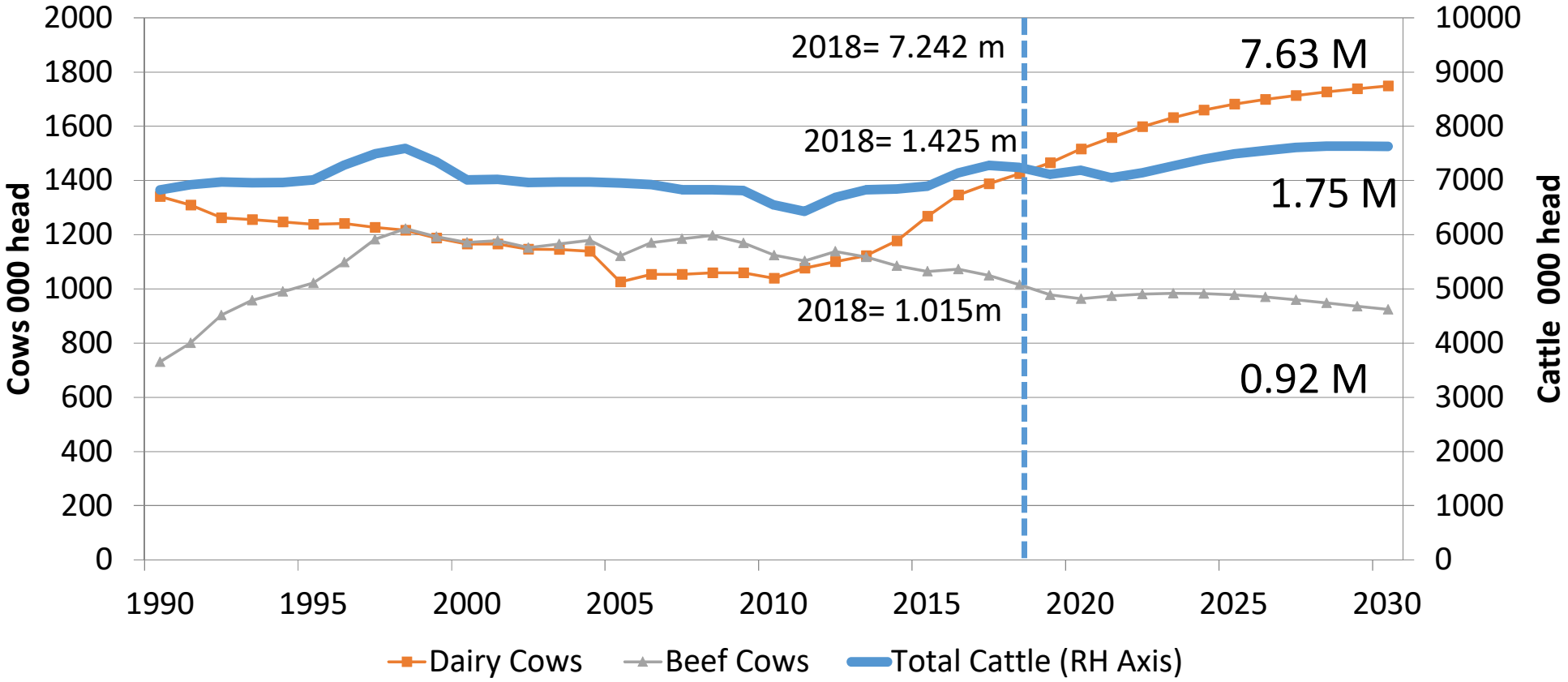
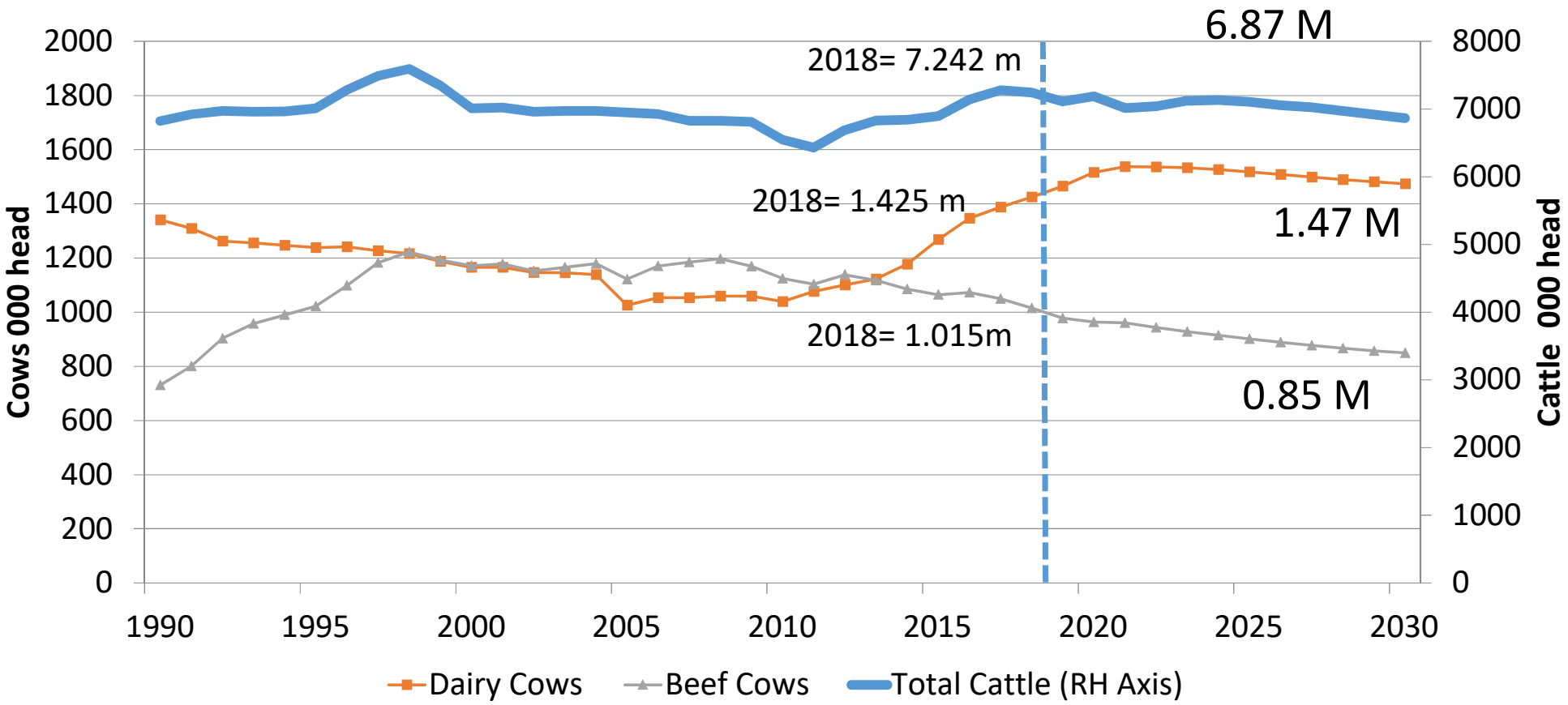
Scenario A+



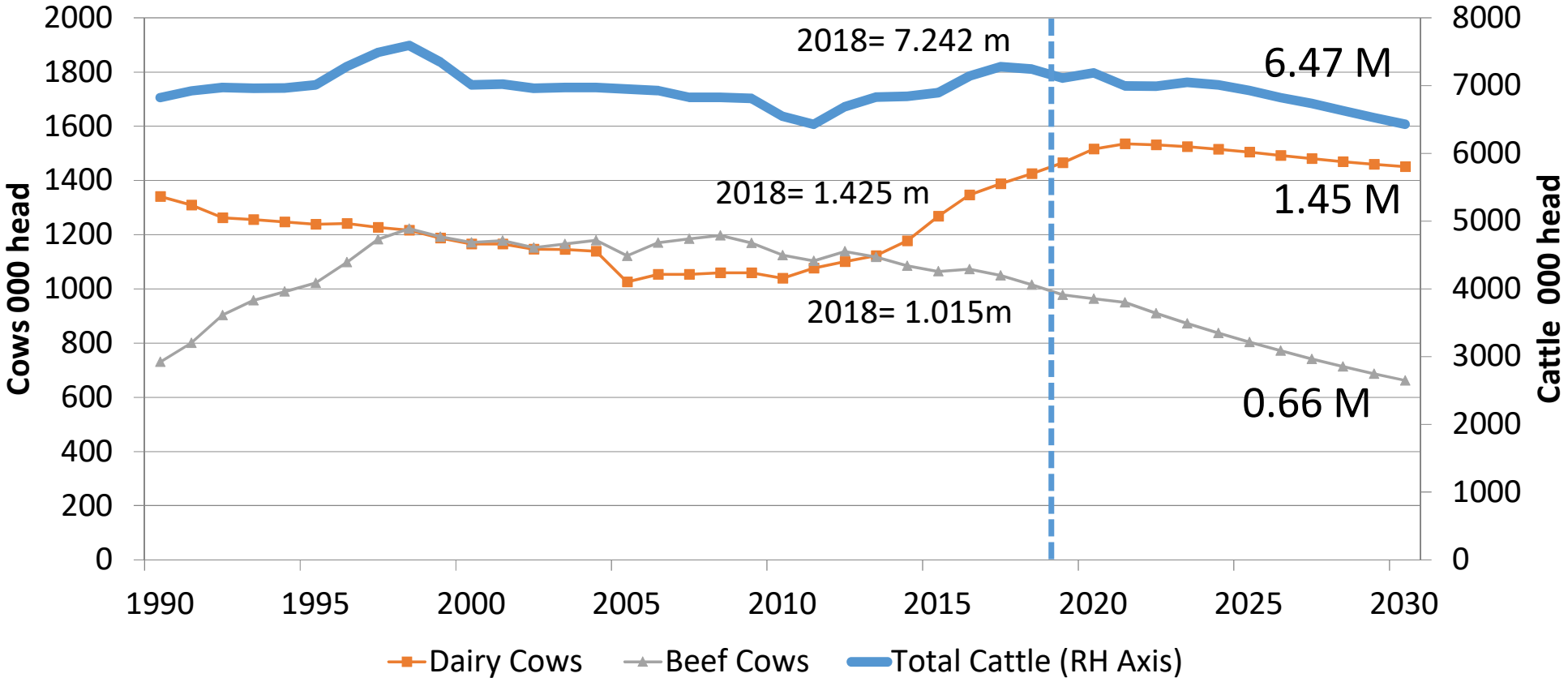
Source: FAPRI-Ireland Model

Scenario B



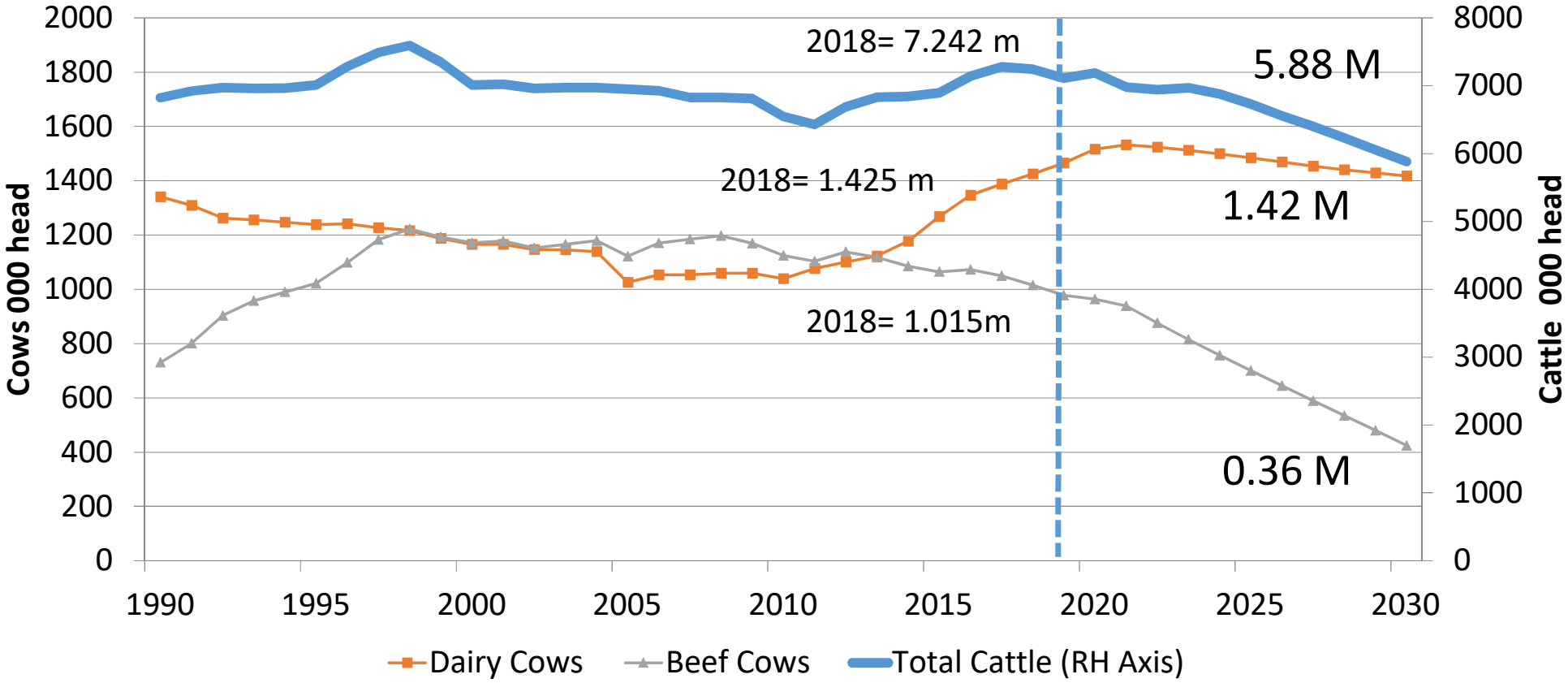
Source: FAPRI-Ireland Model

Scenario C (-20% GHG with Measures)



Source: FAPRI-Ireland Model

Scenario D (-25% GHG with measures)



Source: FAPRI-Ireland Model

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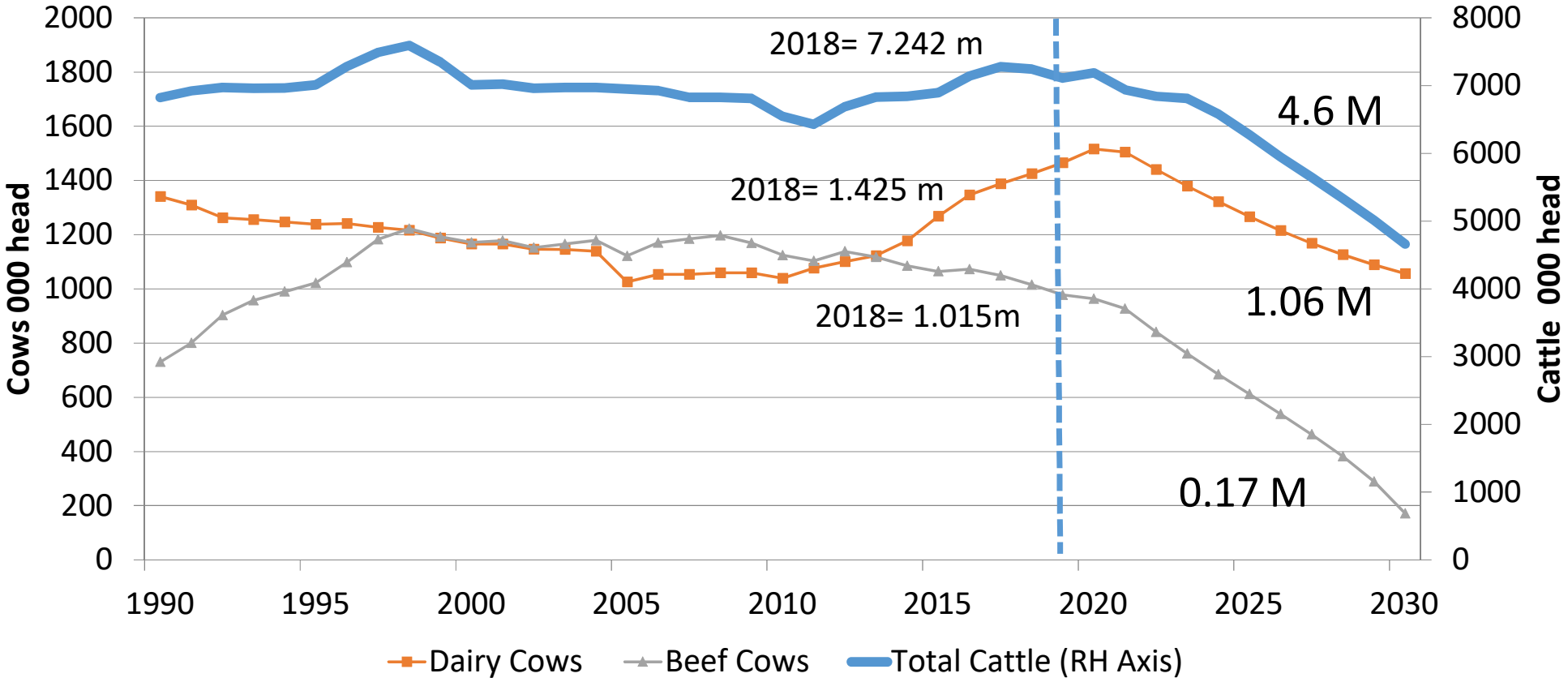
Scenario E (-40% GHG with measures)



Source: FAPRI-Ireland Model

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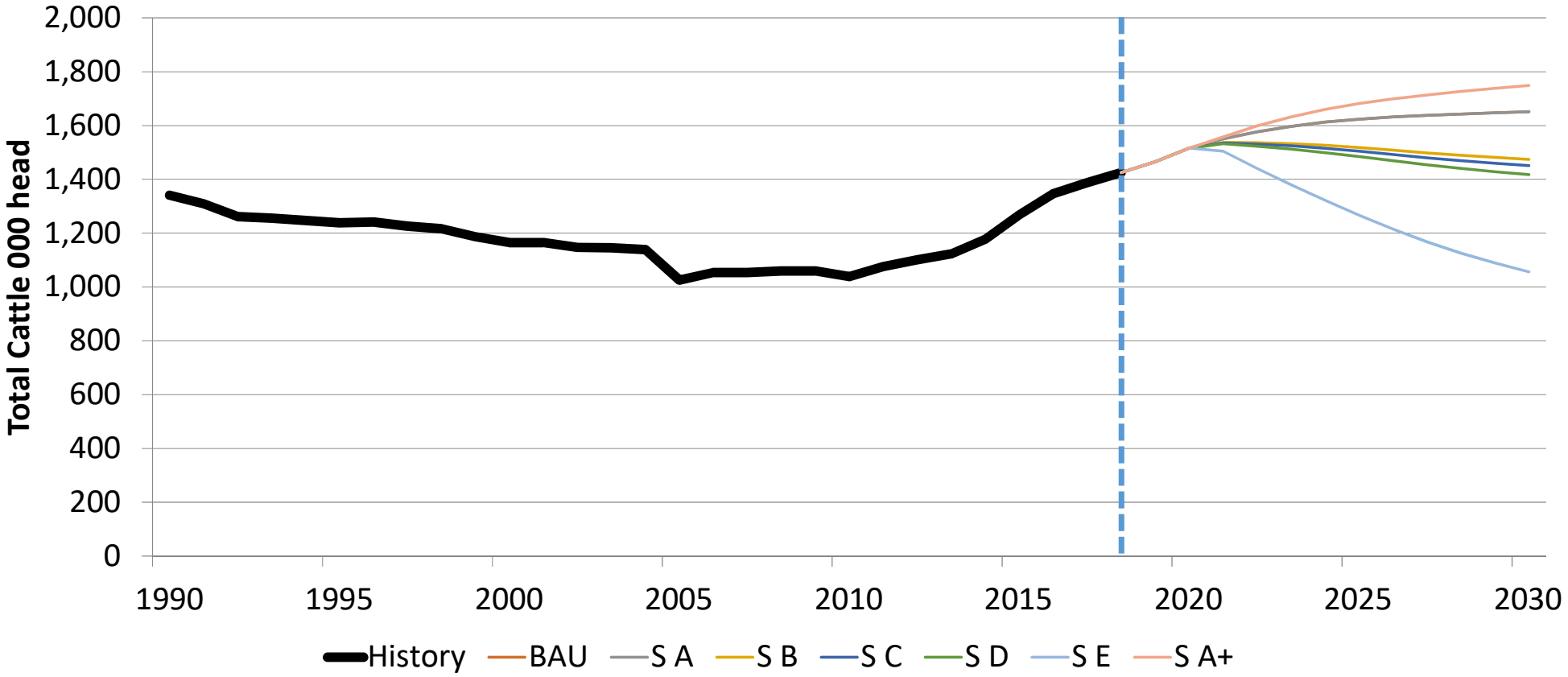
Total Dairy Cow Population: Summary Scenarios A to E



Source: FAPRI-Ireland Model

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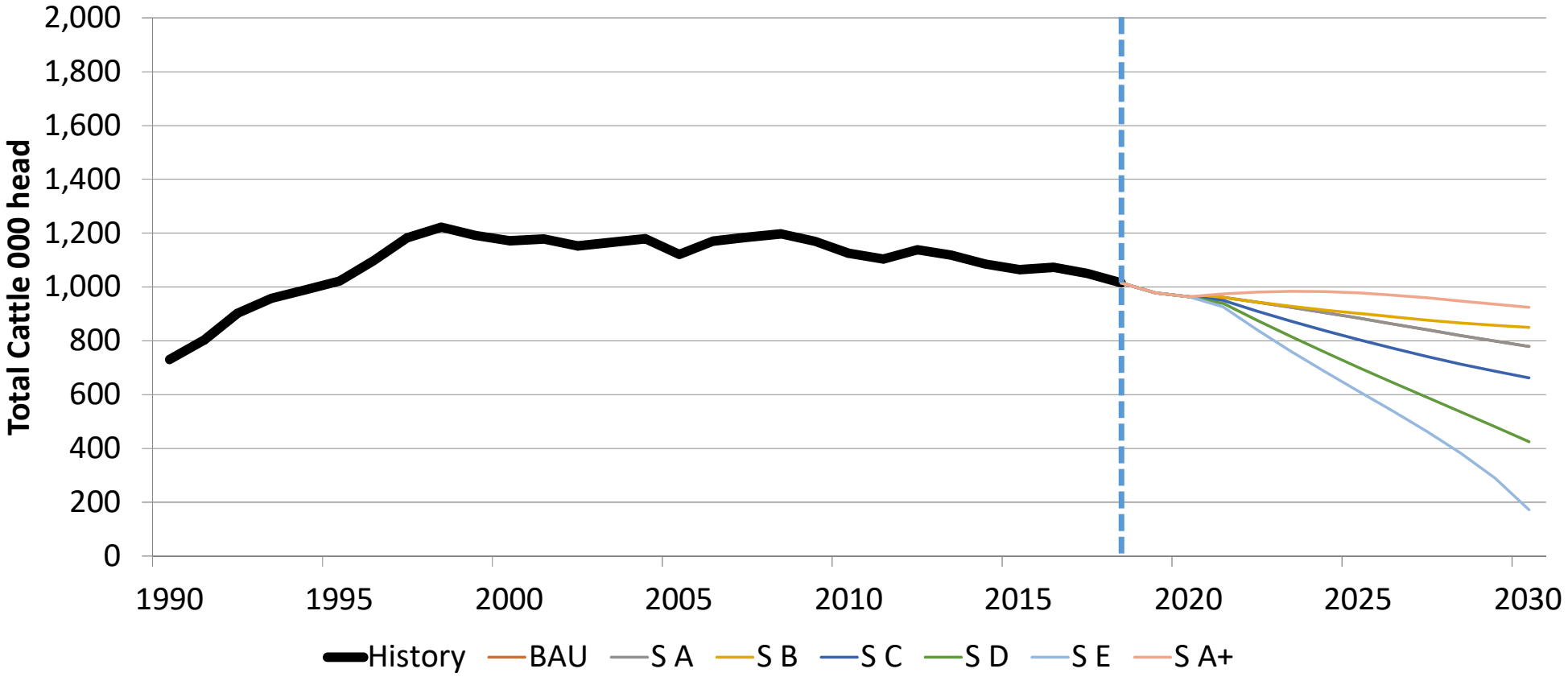
Total Suckler Cow Population: Summary Scenarios A to E



Source: FAPRI-Ireland Model

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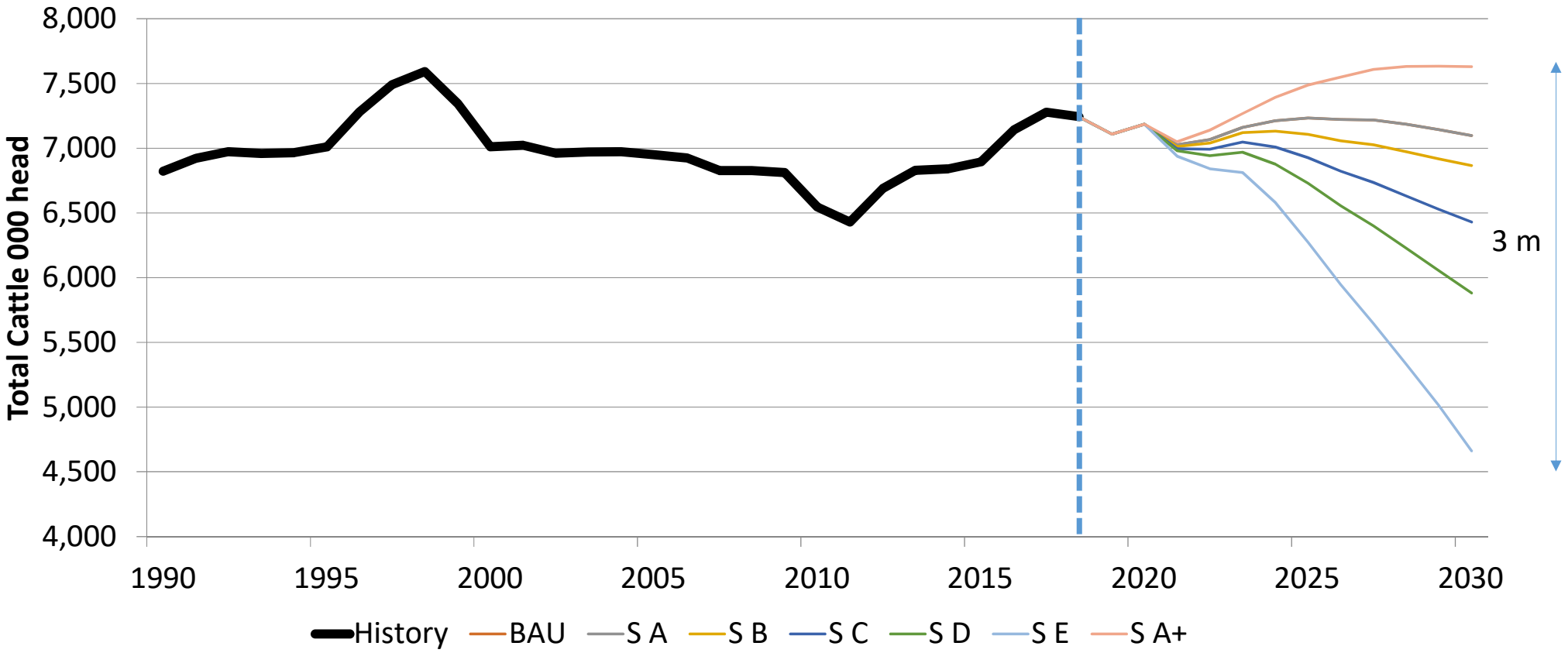
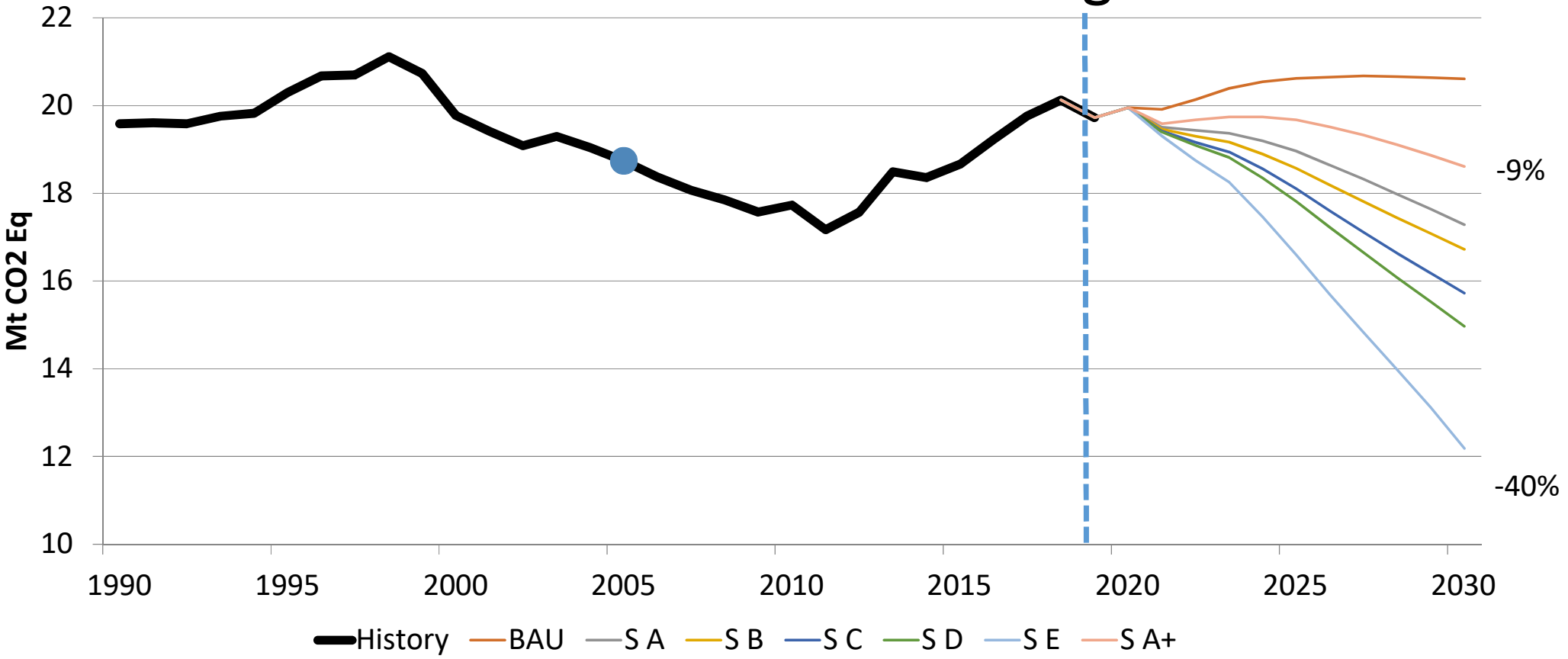
Total Cattle Population: Summary Scenarios A to E



Source: FAPRI-Ireland Model

Summary: GHG emissions

NB: All Scenarios other than BAU include mitigation actions



Source: FAPRI-Ireland Model

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Implications for GHG emissions in 2030

NB: includes estimate of mitigation actions impact

	2005	2018	2025	2030	2030 vs 2018	2030 vs 2005
	Mt CO_2 eq				% change	
Historical	18.74	20.13				
BAU			20.62	20.61	+2%	+10%
Scenario A			18.96	17.29	-14%	-8%
Scenario B			18.57	16.72	-17%	-11%
Scenario C			18.31	16.10	-20%	-14%
Scenario D			17.82	14.97	-25.6%	-20%
Scenario E			16.60	12.18	-40%	-35%
Scenario A+			19.53	18.23	-9%	-3%

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Take home messages

- **Business as Usual Scenario (Scenario A)**
  - with **Measures delivers GHG reductions** consistent with **2019 Climate Action Plan**
- **Scenario A+**
  - Stronger growth in dairy cow herd an weaker contraction in suckler herd
  - Ag Climate Measures **will <u>not</u> deliver GHG outcome** in Climate Action Plan range
- **Scenarios B to E**
  - Greater Ambition for GHG reduction in agriculture would require
    1. New mitigation measures
    2. Reduced Agricultural Activity Levels
    3. Widening what counts as “agricultural” mitigation – incl. LULUCF and Ag Bio-Energy
- If you **reduce activity in agriculture** you also **reduce the GHG mitigation available**
  - Implies sharper cuts in production are required to deliver the more ambitious GHG reductions
- **Scenario E: sharpest cut in agricultural production**
  - Irish cow numbers back to 19th century famine era levels

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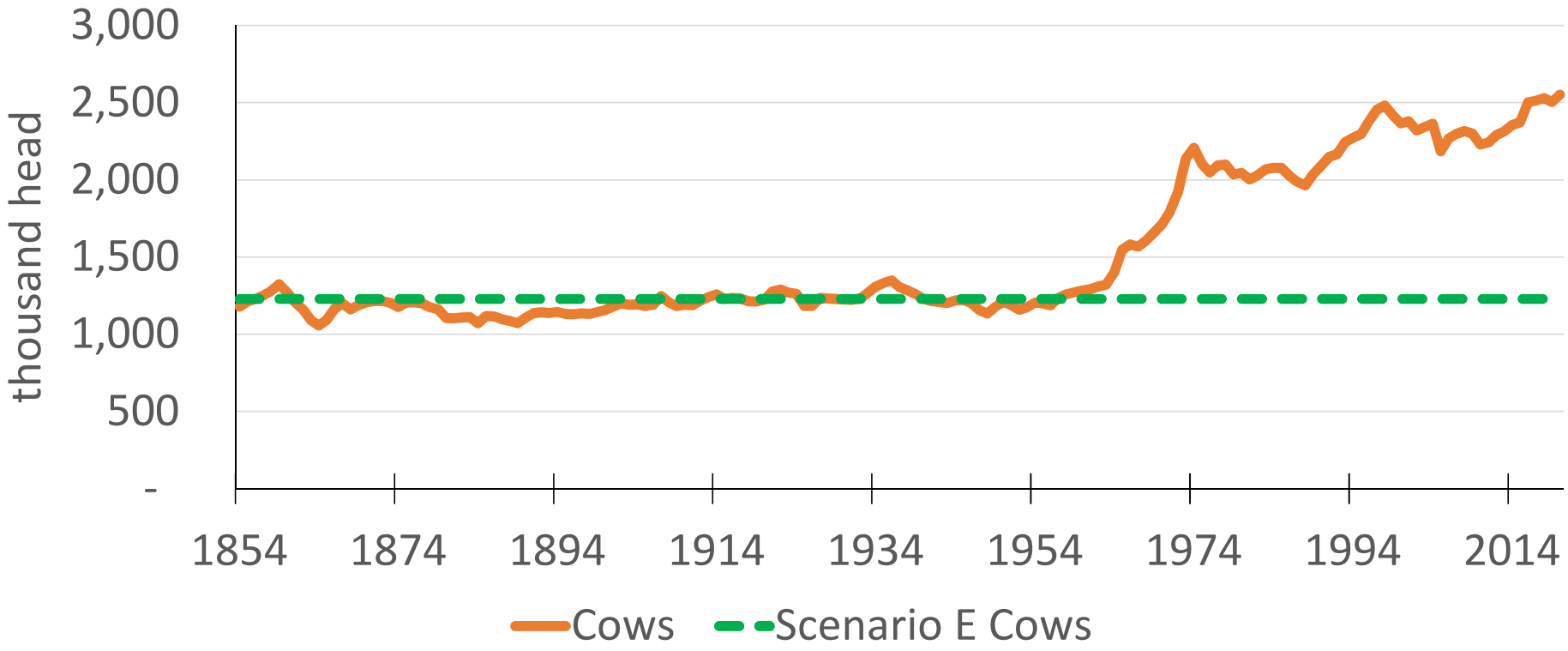
Historical Irish cow* numbers (June 1854-2020)



* Data includes cows only, data on other activities available from CSO “Farming Since the Famine 1847 - 1996” and CSO databases. Cows = sum of Dairy and Other (beef/suckler) Cows

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Summary Table

	2030	2030/2018		2030	2030/2018		2030	2030/2018
	Cattle (m head)			Cows (m head)			GHG (Mega t)	
BAU	7.10	-2%		2.43			20.61	
Scenario A	7.10	-2%		2.43	0%		17.29	-14%
Scenario A+	7.63	+5%		2.67	+10%		18.73	-8%
Scenario B	6.87	-5%		2.32	-5%		16.72	-17%
Scenario C	6.43	-11%		2.11	-13%		16.10	-20%
Scenario D	5.88	-19%		1.84	-24%		14.97	-25%
Scenario E	4.66	-36%		1.23	-50%		12.18	-40%

For all Scenarios Agricultural GHG are emissions form agriculture “with measures” as set out in Ag Climatise

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