The Economics of Afforestation and Management in Ireland: Future Prospects and Plans

Prepared by Prof Cathal O'Donoghue

National forestry conference,

September 2022

Established Chair of Social ad Public Policy; Co-Director of Agricultural Science Programme, University of Galway

PI Ryan Institute

Forestry Challenge Co-Lead SFI BiOrbic Research Centre

Industry Funded Report on Afforestation and Forest Management

Society of Irish Foresters 1942-2022

AuxiliaGroup
Advancing business capability

Ollscoil na Gaillimhe
University of Galway

biOrbic

BACKGROUND TO STUDY

- Working since 2006 on a forest economics portfolio with a team of Collaborators, PhD students and Post-Docs on Forestry Economics, with significant research funding and published in international peer reviewed journals
- This report updates this work to most recent figures and presents the portfolio as a whole
- Glad of Auxilia and Industry Input to bring this work to a wider audience

An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

Science Foundation Ireland Sfi For what's next

Environmental Protection A

COFORD

seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

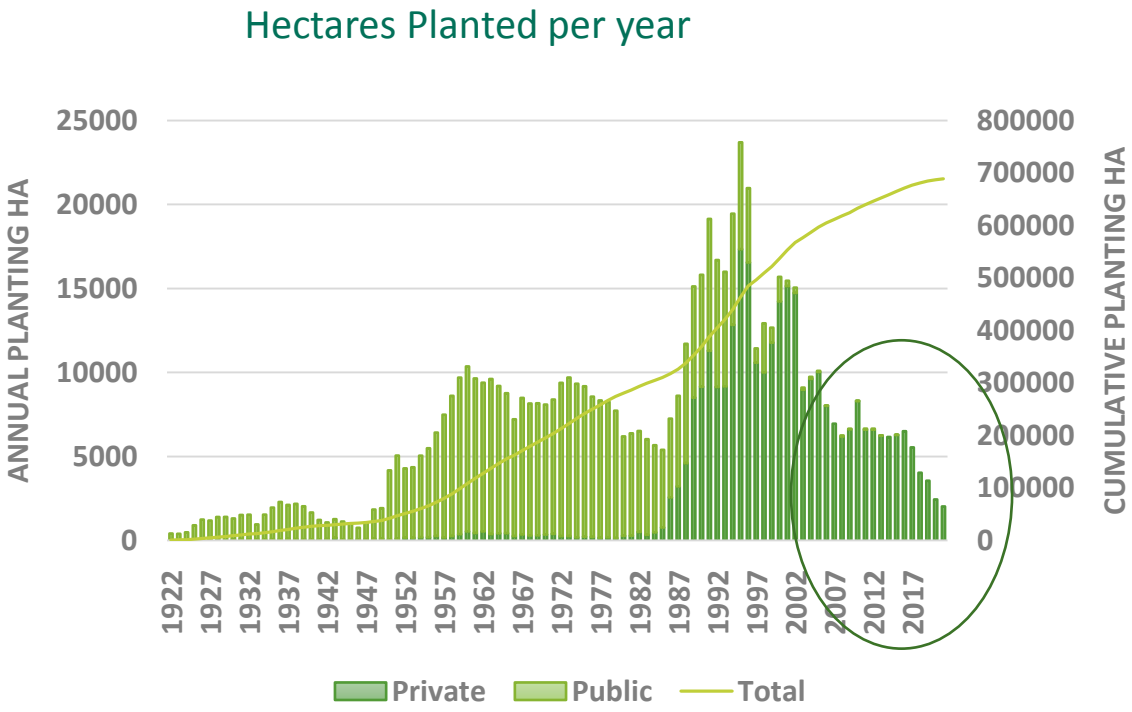
cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

teagasc AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

AuxiliaGroup
Advancing business capability

CONTEXT

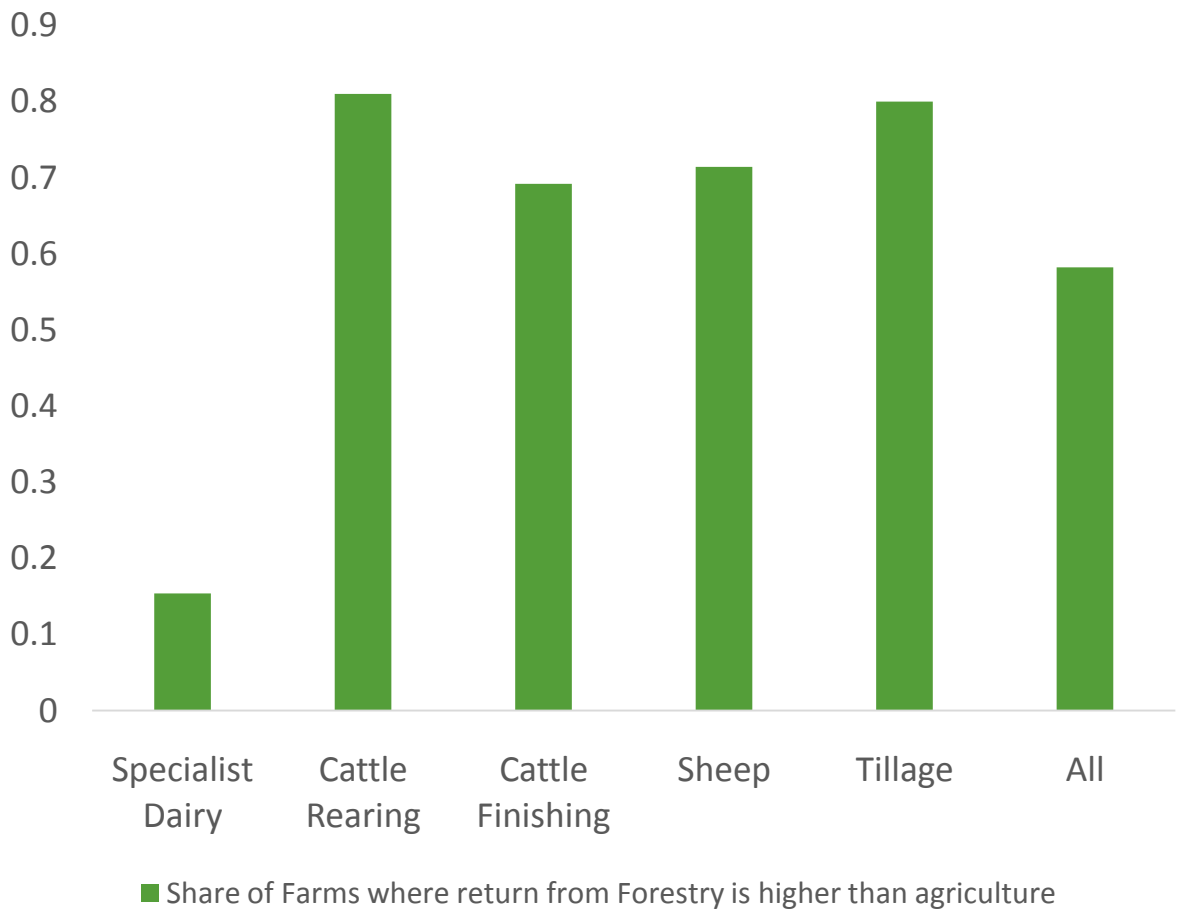
- **Afforestation Policy has been a great Success**
  - **690,000 Hectares Planted in 100 years**
  - At Independence – 1% of land area
  - Now - 11% of land area
  - **Largest land-use change since the foundation of the state**
- **By Comparison → Twice the area of crops, fruit and horticulture**
- However the **area planted has declined substantially** in recent years with 2021 planting **only 8% of peak in 1995** → 2000Ha



The Economics of Farm Afforestation

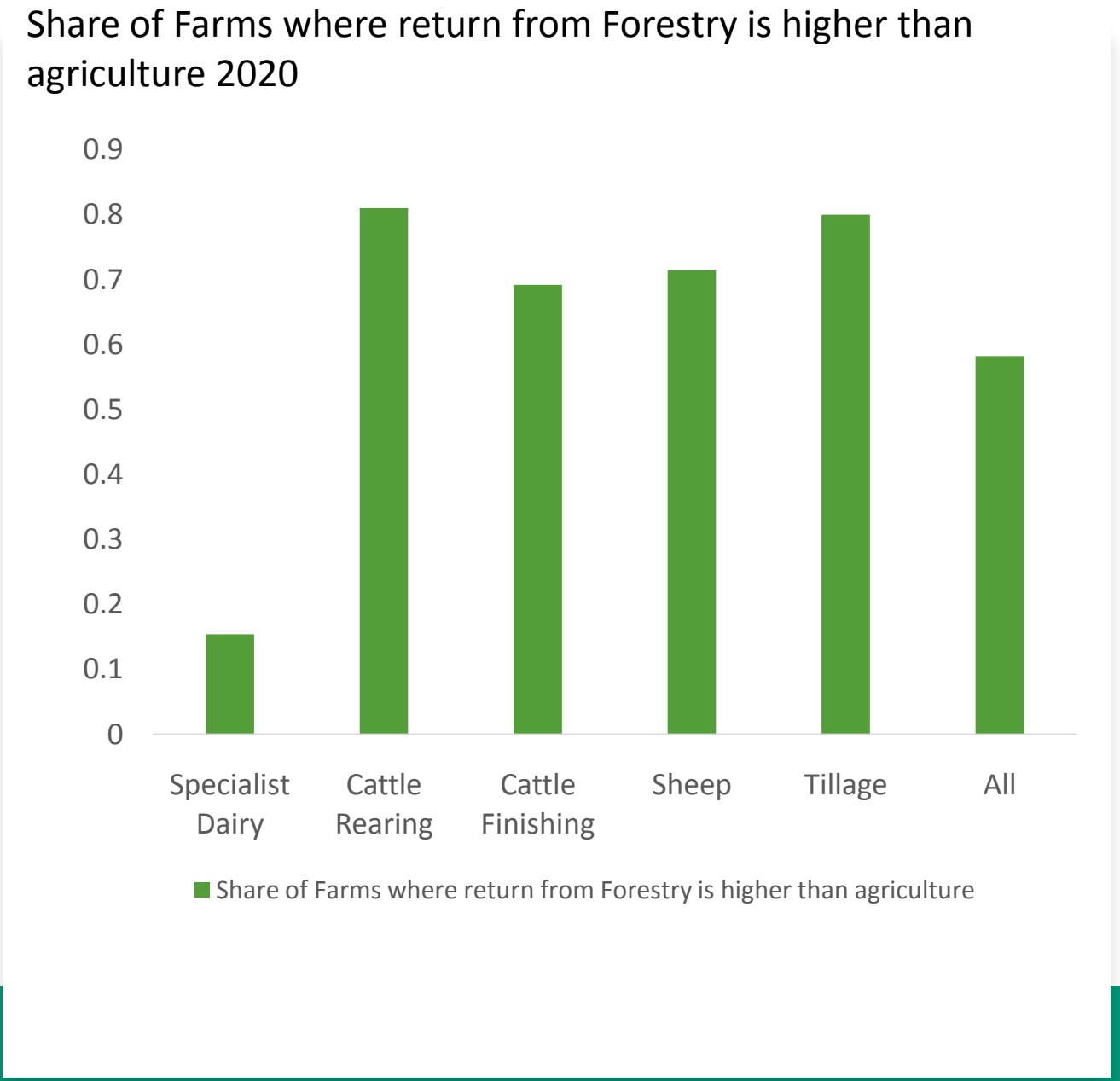
- **Forestry provides a better financial return than agriculture on marginal land.**
- **More than half of cattle and sheep farms would be better off with forestry**
- **However plantation rates are low**
  - Long-term return
  - Cultural Barriers
  - Hassle of changing land use and of engaging with administration and licenses
  - Replanting obligation

Share of Farms where return from Forestry is higher than agriculture 2020



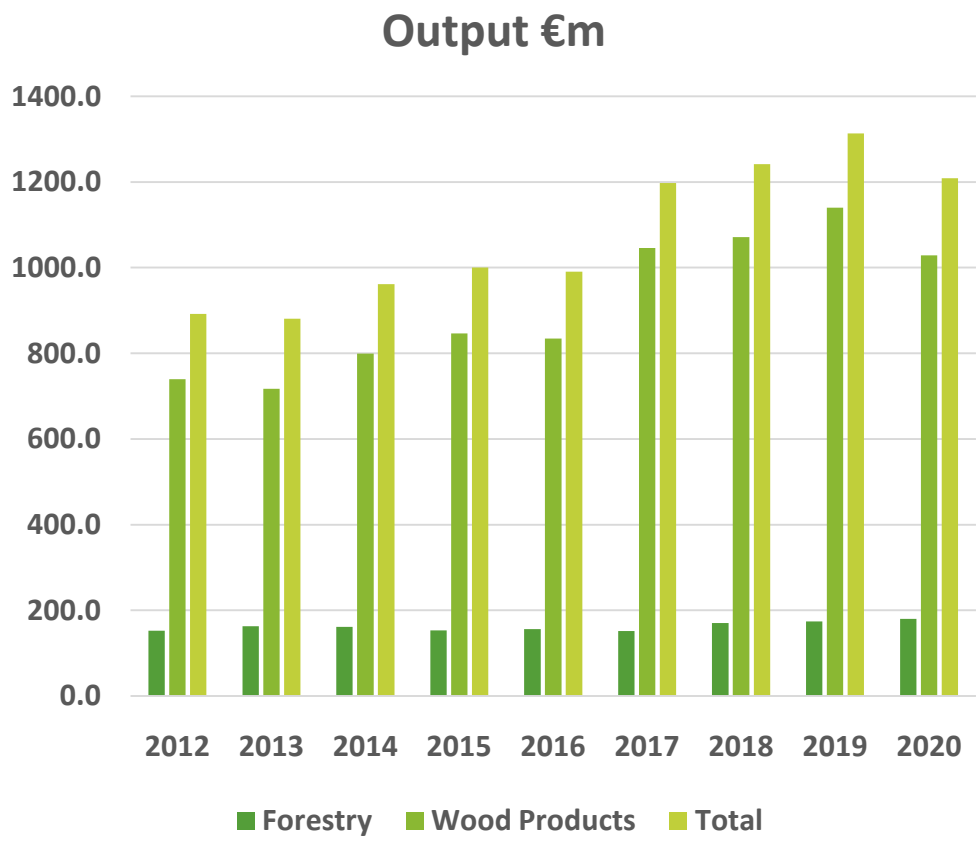
Behavioural Challenges

- **Larger farms are more likely to plant, but have higher returns from agriculture – “spare land”**
- **Smaller cattle farms have a higher return but less “Spare land”**
- **Replanting obligation a challenge**
- Two thirds of farmers make other on farm changes when they plant
- “Retirement farmers”
- “Diversification farmers”
- **Need to link agricultural incentives with forestry**



Forest Value Chain

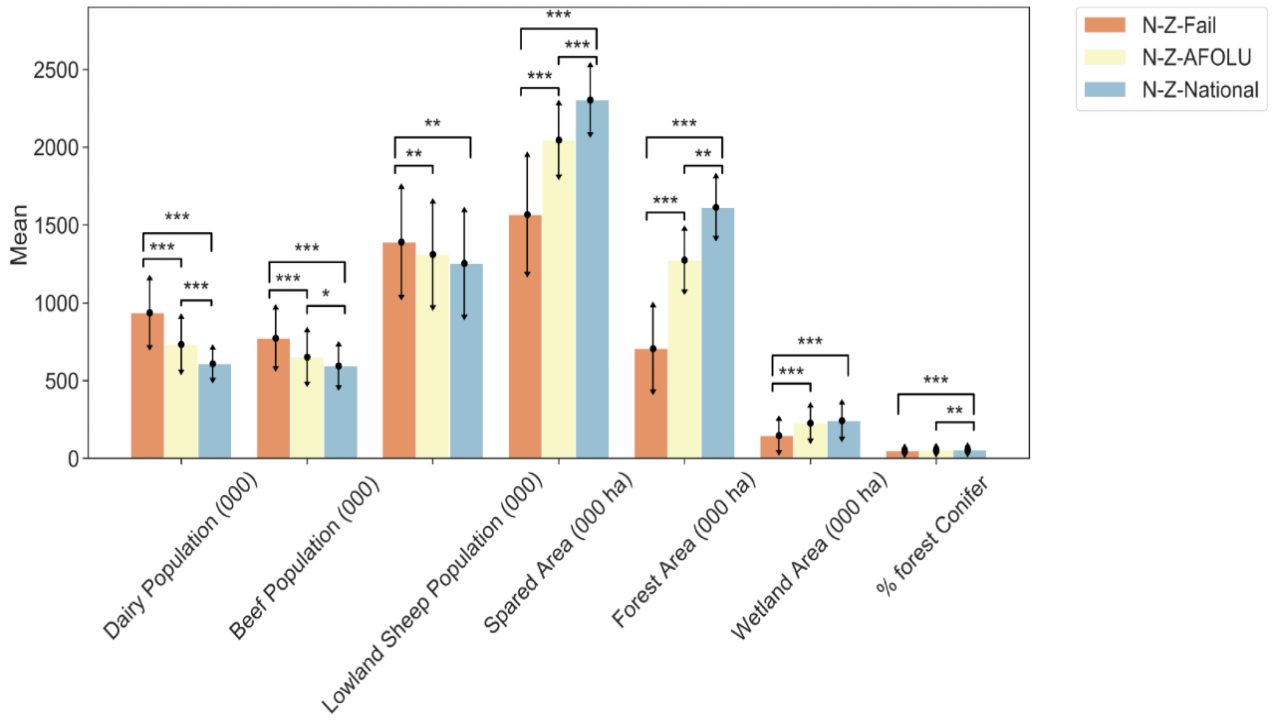
- **The output of the forest and timber products sector is over €1bn per annum**
- About €900m is purchased, mainly in the rural economy directly
- Purchasing so much inputs domestically, it is has the **highest multiplier of any industrial sector** with each €1 of output generating a further €1.7 in the wider economy.*
- It is **higher than the food processing** sub sectors such as dairy which generate €1.3 and beef meat processing at €1.1 in the wider economy
- If **timber can be mobilised, the potential timber supply can increase by 60% to 2035** (Phillips et al.)



*CSO I-O Table Tier II Multiplier

Delivering Carbon Neutrality

- GOBLIN Scenario Model → Of the **166 scenarios that achieved carbon neutrality** within the AFOLU sector, the **mean land area required** is equivalent to about **18% of the land area**.
- Published in journal *Nature Sustainability*
- These results **are very similar to DAFM's** (Department of Agriculture, Food and the Marine's) **target of planting 18% of the land area by 2046**.



nature › nature sustainability › articles › article

Article | Published: 05 September 2022

Randomized national land management strategies for net-zero emissions

Colm Duffy, Remi Prudhomme, Brian Duffy, James Gibbons, Pietro P. M. Iannetta, Cathal O'Donoghue, Mary Ryan & David Styles

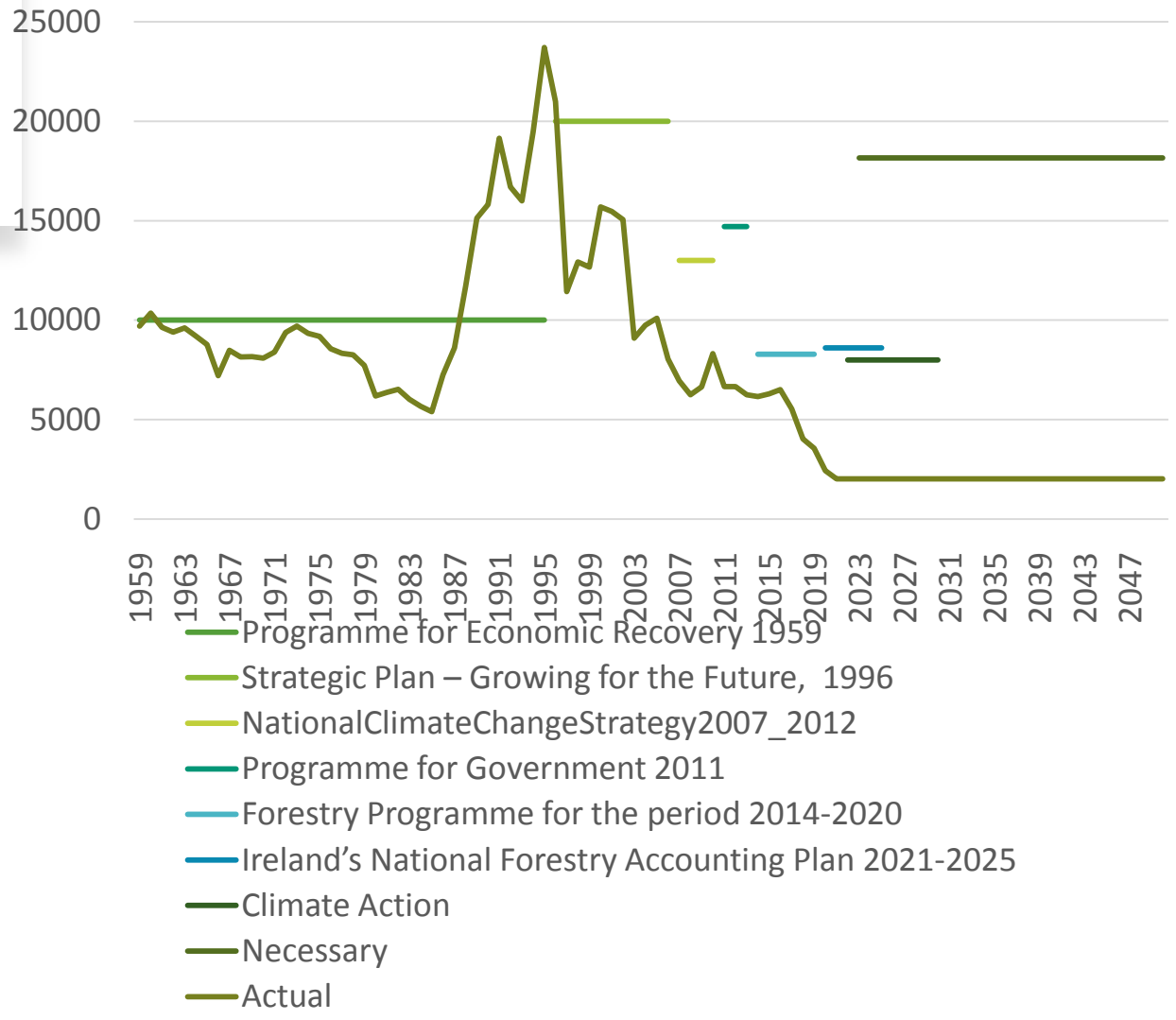
Nature Sustainability (2022) | Cite this article

Metrics

TARGETS

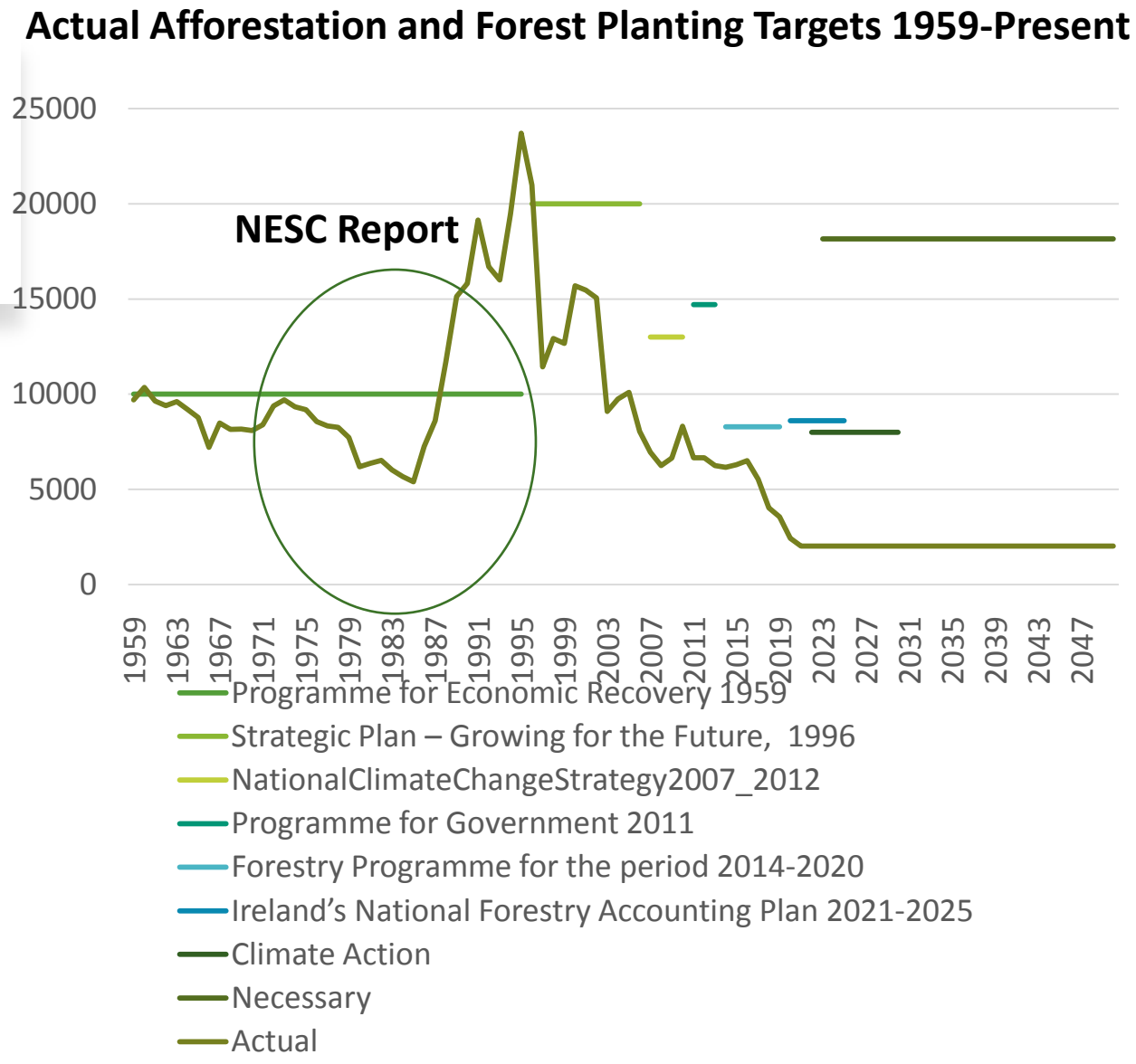
- **DAFM Policy to Achieve 18% by 2046→Consistent with achieving Carbon Neutral Agriculture and Land Use by 2050**
- **In 2014,** this meant **14500 Ha** per year → **Now** it means **18000 Ha**
- **However present target is only 8000 Ha**
- **Planting 2000 ha** means that **we miss the target by 6000 Ha** and the **need by 16000 Ha**

Actual Afforestation and Forest Planting Targets 1959-Present



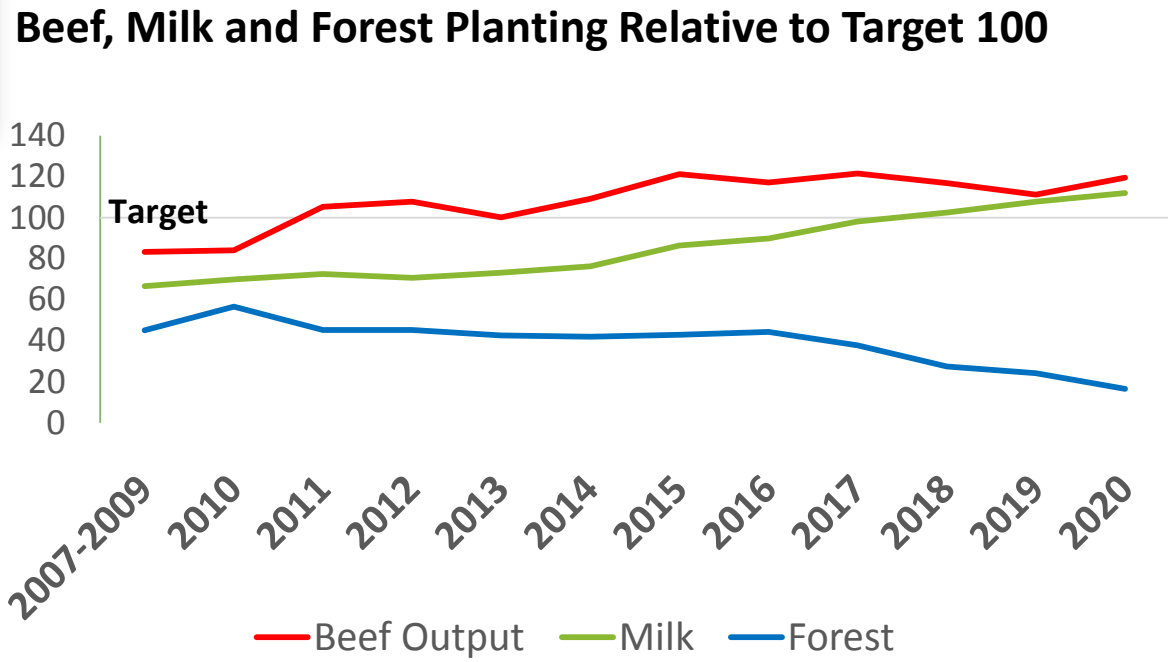
TARGETS

- **We have been here before**
- **On joining EEC planting rates fell sharply**
- However, Frank Convery 1979 NESC Report developed a multi-faceted strategy
- Substantial **Financial, Behaviroural and Organisational Change →huge improvement** in 1980's and 1990's
- **Time for a hard think?**
- **Business as usual won't work**



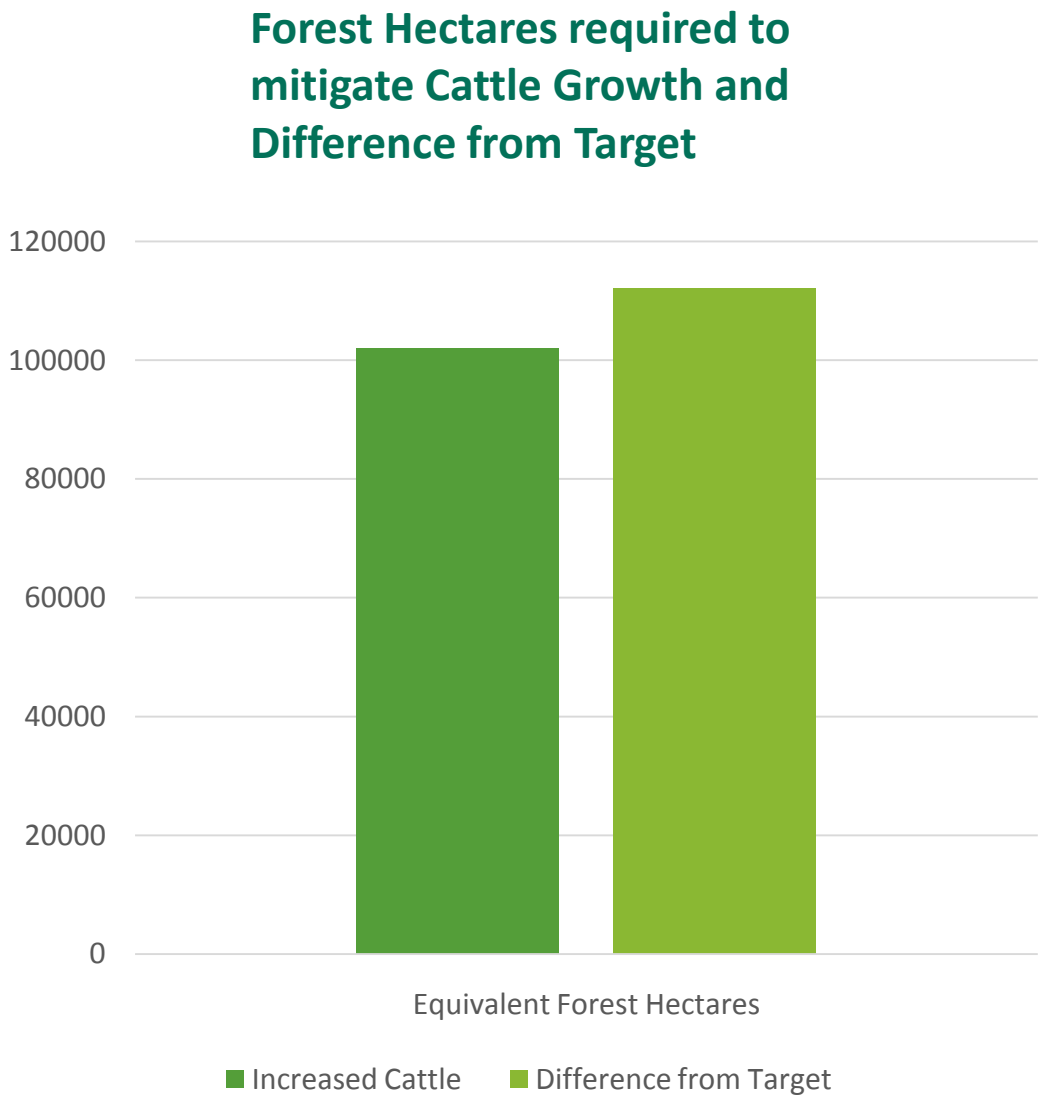
Food Harvest 2020

- Looking back to **Food Harvest 2020**
- The ambitious **milk target was met in 2017**
- The less ambitious **beef target was met almost immediately**
- The **forest target has only once reached 50% of target** and has been worsening



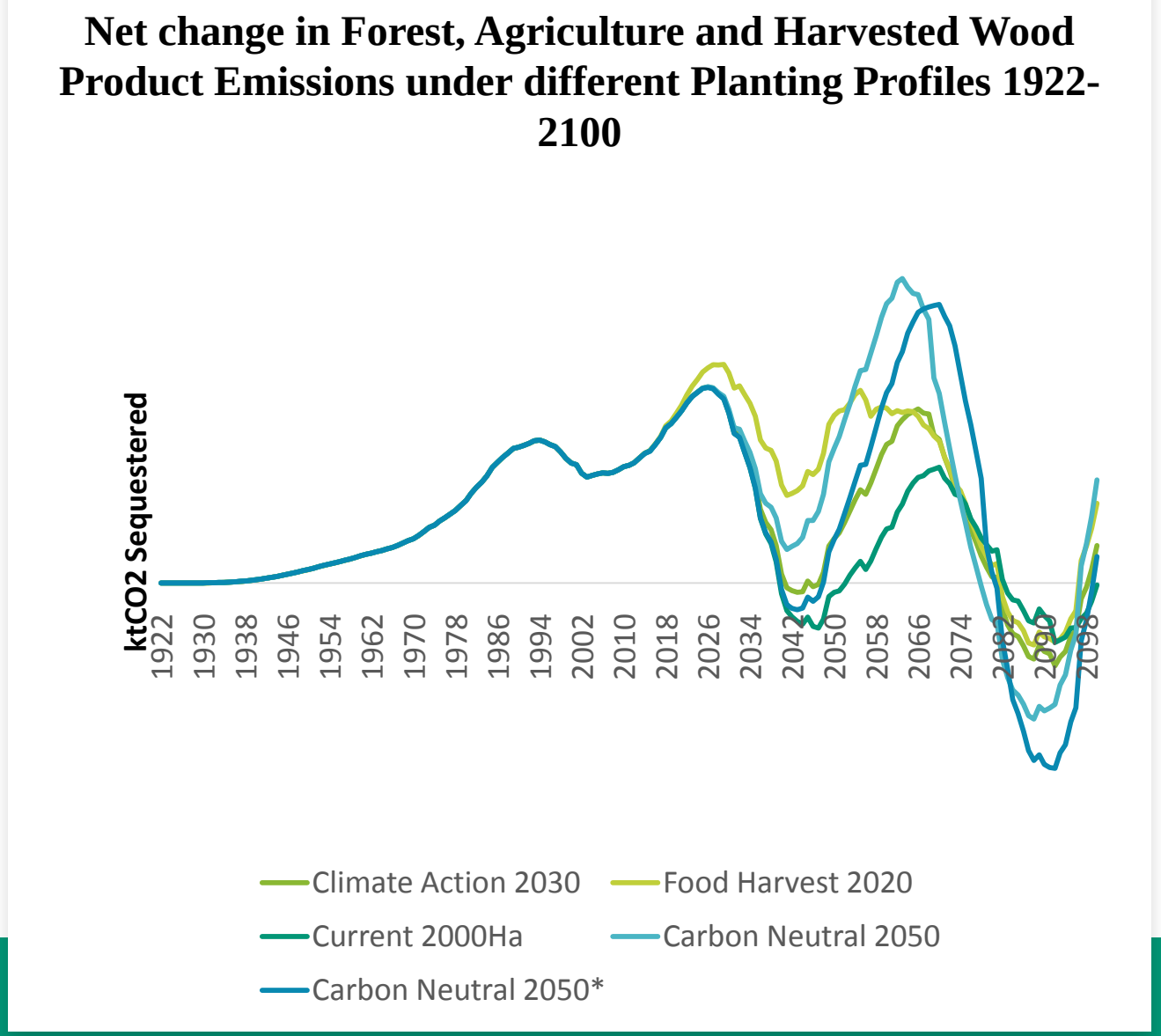
Dairy Expansion and Forestry

- Since 2011, the number of livestock units has increased by 386000 or about 865000 Cattle
- On average each hectare of forest sequesters the emissions from 3.8 Livestock Units
- **102000 Hectares of Forest would have mitigated the emissions from Dairy Expansion**
- **We missed the target by 112000**
- **Meeting the target could have enabled carbon neutral dairy expansion**



Carbon Cliff

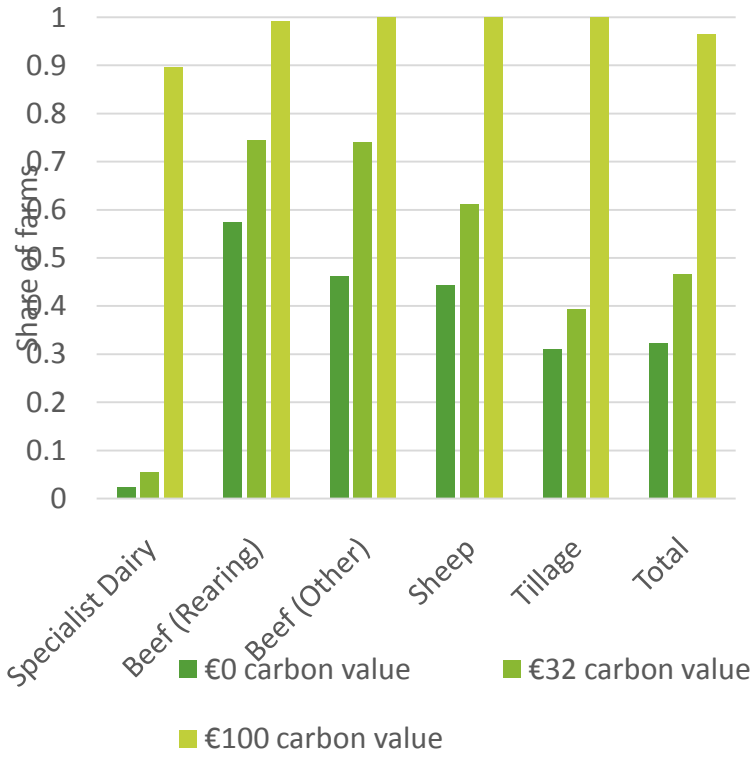
- Because of **existing fall off in planting, there will be a carbon cliff, where sequestration reduces substantially**
- The **more we can plant now, the lower that cliff**
- Meeting FH2020 targets would have minimised cliff
- **Delaying the delivery of the 18% target** by a decade **has major implications for carbon neutrality in 2050**



ENVIRONMENTAL IMPACT: AGRICULTURAL GREENHOUSE GAS (GHG) EMISSIONS

- **What if carbon incentives replaced current afforestation incentives relative to market return….**
- government carbon value increases from €32 per t$CO2$eq in 2020
- to **€100 in 2030**
- **Forestry generates a higher return than all other land use types at this carbon price** → balance shifts towards forestry across all system

Share of farms with greater forest incomes at different carbon values



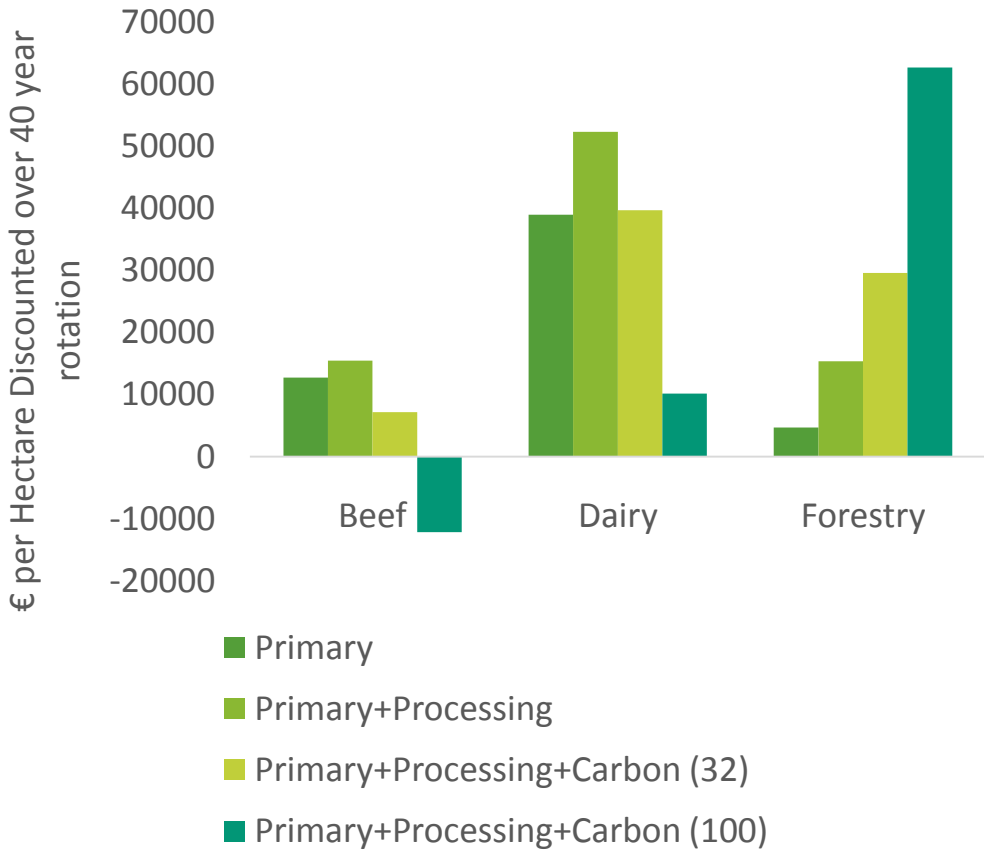
Department of Public Expenditure and Reform 2019. https://www.gov.ie/en/publication/public-spending-code/

Assuming a 5% Discount Rate

Value Chain Differences including Carbon

- **Market →** Value of primary production and processing return per hectare of forestry is similar between beef and forestry. Lower than Dairy
- **Incorporating the carbon value of emissions and sequestration**, the **return for forestry passes out beef** at a carbon price of **€32 per tCO2**
- **At €100 per tCO2, forestry has a higher return than Dairy**
- **National Carbon Price in 2050 → €265! (DPER)**

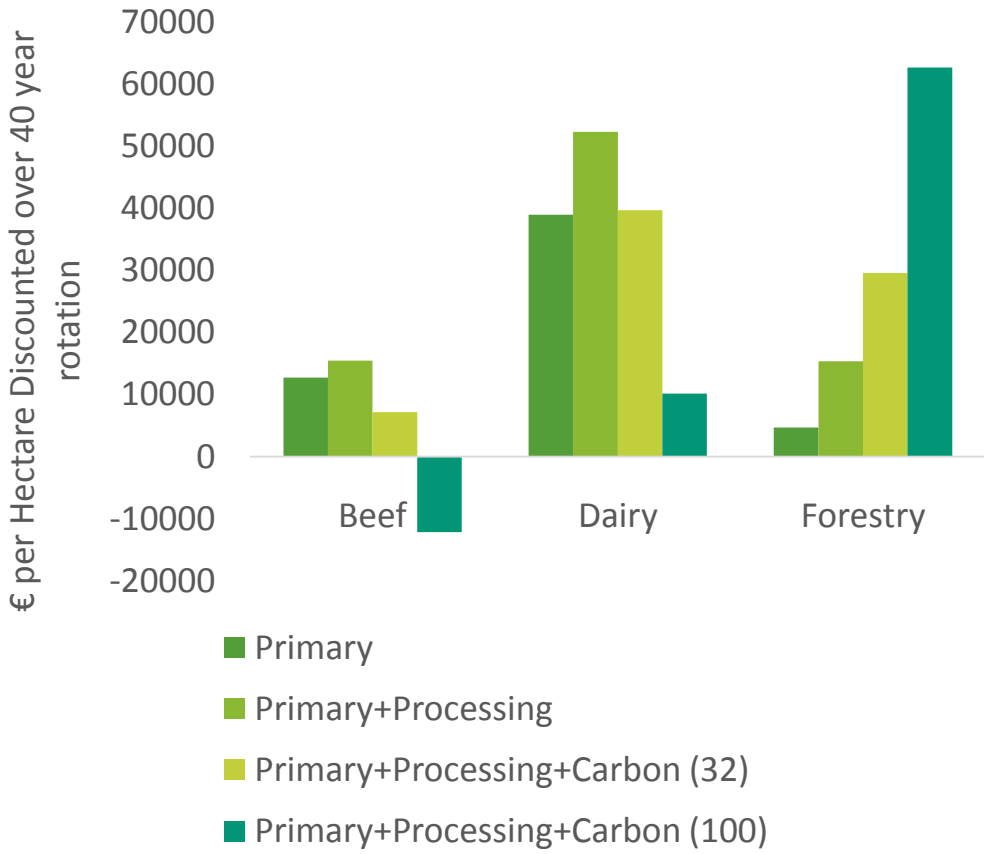
Discounted Return per Ha over 40 years at different Carbon Price



Value Chain Differences including Carbon

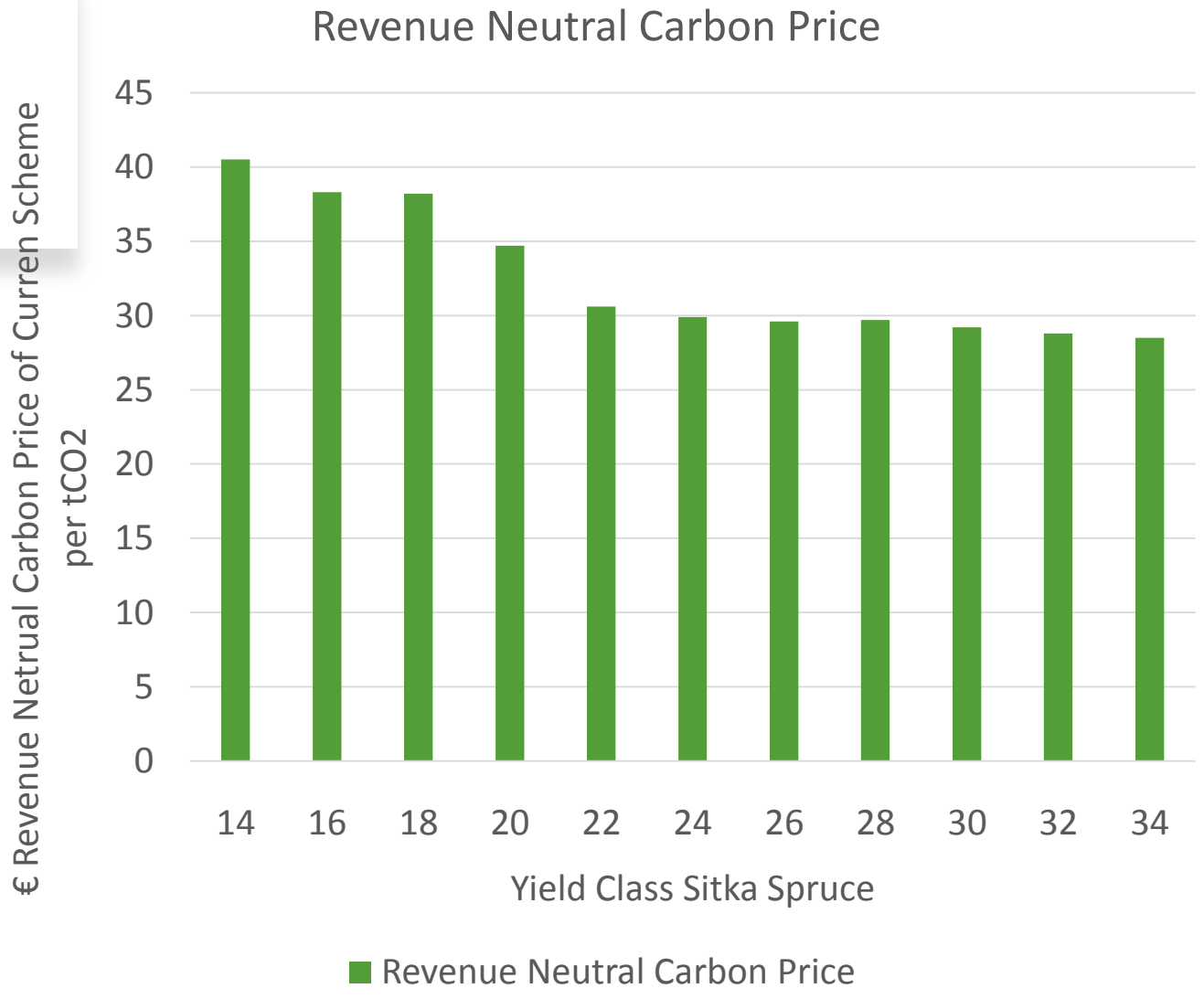
- **Missing target by 6000 Ha (distance relative to Climate Action Target) costs more than €400m at a €100 carbon price over a 40 year forest rotation**
- However **the cost is over €1bn relative to need of 18000 Ha** over full rotation

Discounted Return per Ha over 40 years at different Carbon Price



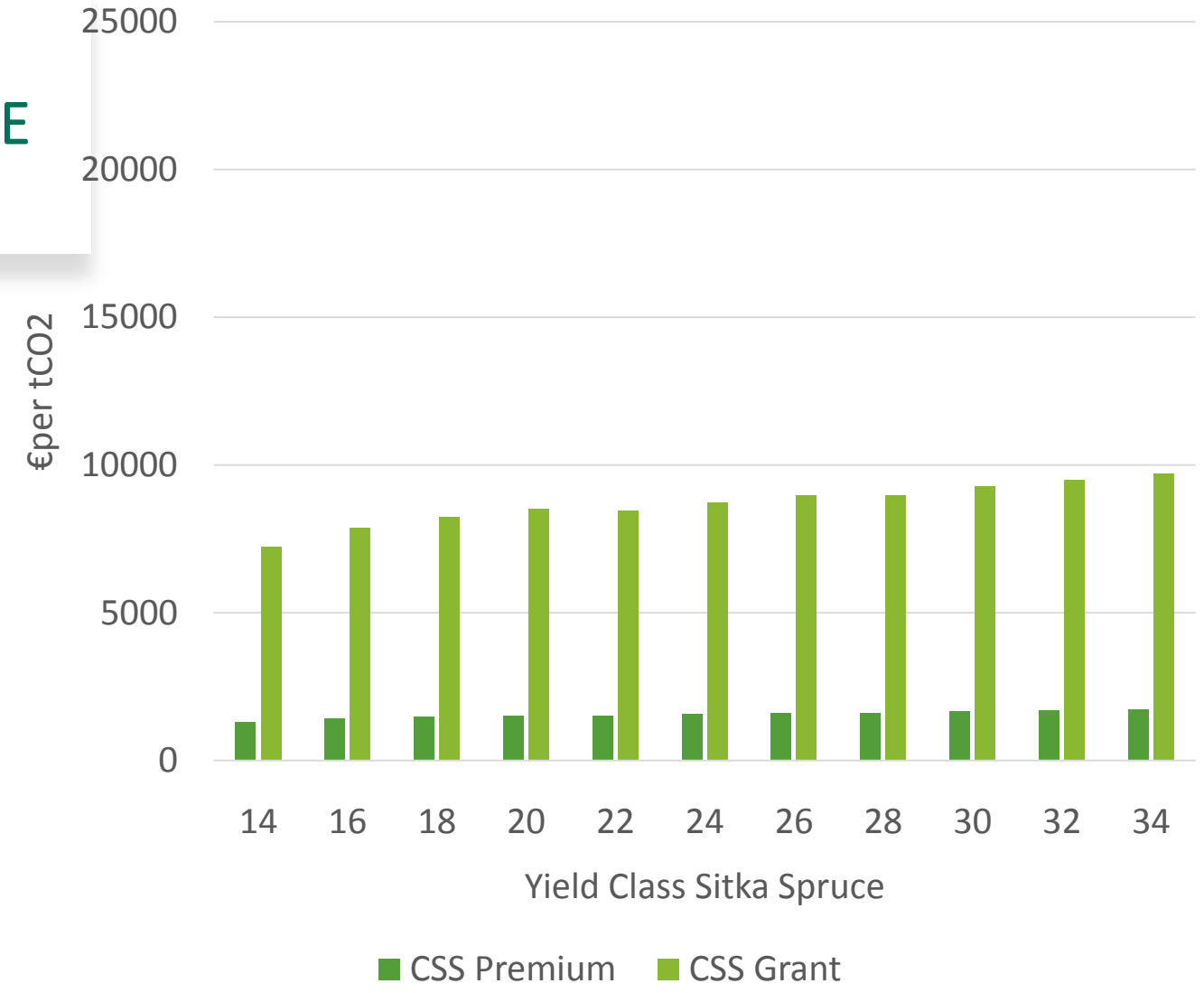
Effective Carbon Price of Current Supports

- **Current Forest Support Programme** Comparing Establishment Grants, Premium and Tax Relief, the Carbon Price **equivalent to ~ €40 per tCO2**
- **A little bit more than the carbon price in 2021**
- **As the Carbon Price moves to €265 per tCO2 in 2050 - Very significant opportunity to shift financial incentives** to have an afforestation scheme with higher supports that realises a **positive cost benefit analysis under the public expenditure code**



Carbon Sequestration Scheme

- Excluding, branches, litter, below ground, each rotation yields a net carbon benefit in above ground timber
- Carbon Sequestration Scheme
  - Discounted value of net carbon sequestration over rotation
  - One third up front plus
  - 15 Annual Premia
- ~ €1600 Premium + €8500 upfront payment possible – varies by YC



Carbon Sequestration Scheme

- Avoided animal emissions from agricultural land use change, varying from on average €14084 to €20184 per hectare, are also assumed to accrue to the state.
- Win-win and adds to the Cost-Benefit Analysis
- **As the Carbon Price moves to €265 per tCO2 in 2050** - **Very significant opportunity to shift financial incentives** to have an afforestation scheme with higher supports that realises a **positive cost benefit analysis under the public expenditure code**

RECOMMENDATIONS - STRATEGIC

- **Strategic**
- Recommendation 1. **Retain** the longstanding target of **achieving the 18% forest cover target by mid-century**. Given the time lag between planting and sequestration, there is need to deliver significantly higher planting earlier, well beyond current targets.
- Recommendation 6. Develop a **national land use strategy** to provide a formal framework to make land use planning decisions
- Recommendation 13. **Review the current afforestation business model to improve scale** economies and deliver wider scale

RECOMMENDATIONS - BEHAVIOURAL

- **Behavioural**
- Recommendation 2. **Improve the design of forest payments** to improve their **compatibility with behavioural incentives** including going beyond basic compensation
- Recommendation 9. Develop a **Carbon Neutral Certification with the Cooperatives for Dairy Farms**
- Recommendation 10. **Improve Afforestation Incentives** by Increasing Flexibility in relation to the **replanting obligation**.
- Recommendation 7. Review the legislation on forestry and consider the **introduction of a single consent covering planting, road construction, management and felling**.
- Recommendation 8. Afforestation Incentives and Forestry Guidelines should be **aligned to CAP rules and regulations** to reflect the joint forestry and agriculture decision making that happens on farms

RECOMMENDATIONS - FINANCIAL

- **Financial**
- Recommendation 3. **Link afforestation public good payments to carbon prices**. Develop alternative financial instruments to continue to deliver up front payments in a carbon sequestration scheme and over multiple rotations
- Recommendation 4. Develop mechanisms to **deal with current inflationary environment** to reduce risk by stakeholders and increase confidence
- Recommendation 14. **Eliminate disincentives and anomalies** that arise from the interaction of afforestation and **tax and social welfare policy** for all stakeholders

RECOMMENDATIONS - ORGANISATIONAL

- **Organisational**
- Recommendation 5. **Full implementation of the MacKinnon report** is necessary in a defined timeframe to deal with uncertainty due to **licensing** delays.
- Recommendation 11. **Establish a new Forestry Development Agency**.
- Recommendation 12. Undertake a **review of the optimal department location for forestry** in achieving **national carbon neutrality goals**.

Thank you

Cathal.odonoghue@nuigalway.ie

Ollscoil na Gaillimhe
University of Galway

biorbic

AuxiliaGroup
Advancing business capability