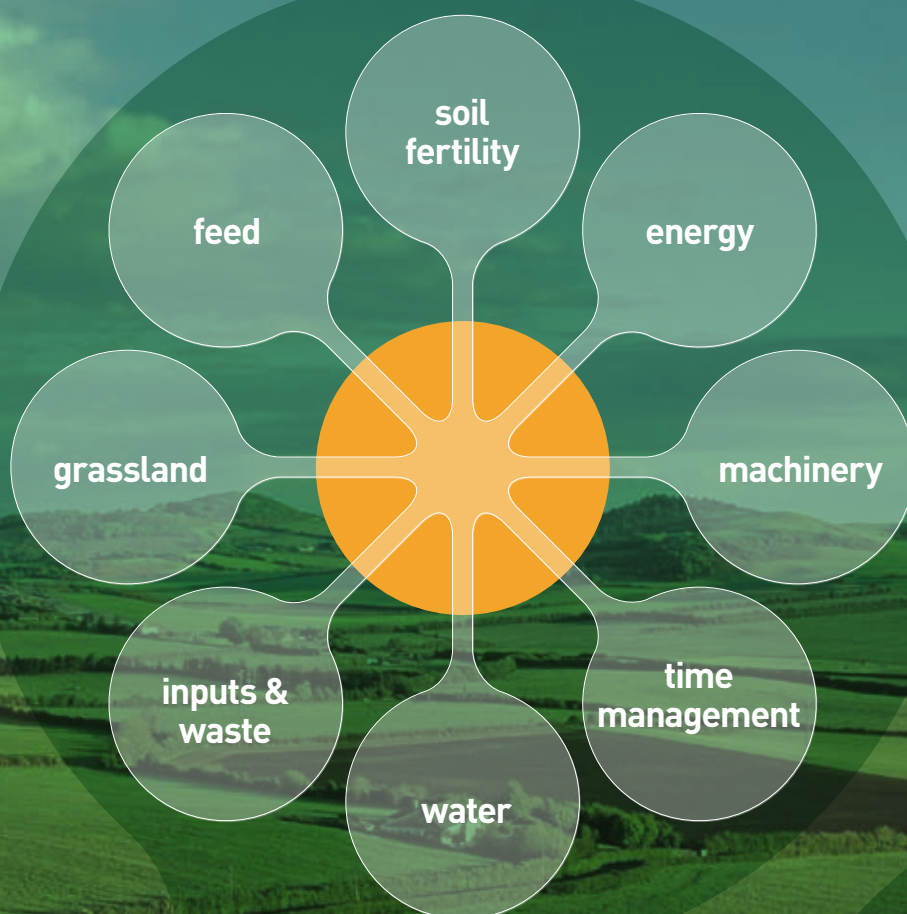


PROGRESS REPORT 2017

*Improving farm returns.
Enhancing the environment.*



Smart Farming[®]

Improving farm returns.
Enhancing the environment.



€8,700

Average cost savings identified on the participating farms.



10%

Average greenhouse gas emissions reduction.



€10,200

Dairy farms represented the largest average cost savings of the participating farms.



€6,900

Cost savings identified on participating livestock farms.



47%

Overall savings due to addressing soil fertility.



21%

Overall savings due to good grassland management on participating farms.

DISCLAIMER: The cost savings and environmental measures identified in the assessments, represent Smart Farming's best endeavours to encourage improved resource efficiency, to improve farm incomes and enhance the environment and are dependent on the recommendations identified being acted upon.

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**Smart Farming
farmer William
Cassidy, Carlow and
Programme Leader
Thomas Cooney
discuss soil fertility
with Joe Healy IFA
President.**



**Roinn Cumarsáide, Gníomhaithe
ar son na hAeráide & Comhshaoil**
Department of Communications,
Climate Action & Environment

Ireland is experiencing a strong economic recovery. While recognising the challenges presented by Brexit and other external risks, we have been the fastest growing economy in Europe for the last three years. The recovery is underpinned by strong Government policies, such as the Action Plan for Jobs and Action Plan for Rural Development. Unemployment is now back at 2008 levels and the target of creating 45,000 new jobs in the economy this year is on course to be achieved.

Ireland's recovery must also be sustainable. This means providing a good quality environment to benefit the health and wellbeing of our citizens. It means accelerating the national response to reducing greenhouse gas emissions and addressing environmental deficits, through legislation, where necessary. It also means informing, engaging and supporting communities in the protection and improvement of the environment.

Collaborative initiatives such as Smart Farming are crucial to delivering a sustainable recovery, through its dual mandate of improving farm returns while enhancing the environment.

This is where I believe Smart Farming is making a difference. The leadership provided by IFA is commendable and the collaboration with the EPA ensures that the policy direction of the Smart Farming programme will continue to evolve to meet changing environmental challenges. In addition the expertise provided by Teagasc, University College Dublin, Farm Tractor & Machinery Trade Association, Fertilizer Association of Ireland, Irish Grassland Association, Sustainable Energy Authority of Ireland and the National Federation of Group Water Schemes, ensures that the most up to date information is being shared with farmers.

Smart Farming works. It is aligned with the European Commission's Action Plan for the Circular Economy and the objectives of Ireland's National Waste Prevention Programme. For the farmers involved, Smart Farming has a real effect, identifying average cost savings of over €8,000 and reducing climate impact by 10% on participating farms.

Smart Farming is making a difference for farm families, their communities and the wider environment. This is a message that I will share with European colleagues at Council of Ministers and when I speak at the UN Climate Change Conference in Bonn, Germany in November.

Keep up the good work.

Denis Naughten, T.D.
Minister for Communications, Climate Action and Environment



Improving farm incomes continues to be at the heart of all of IFA's activities. This means engaging directly with processors and retailers to ensure that farmers receive a fair price return for their high quality produce. From a policy perspective, it means representing farmers at national and EU level, to maximise direct payments, seek a fair trading environment, and to shape the development of farm schemes and tax measures that support farm investment, competitiveness and restructuring.

Incomes can also be improved by looking around our own farms and asking: are there things we could do to reduce our costs and improve returns? And can these actions also contribute to an improved environment? This is what resource efficiency means and what Smart Farming is all about – making a difference to the bottom line, which then leads to positive impacts on the wider countryside.

In 2017 over 1,000 farmers (who follow in the foot-steps of previous participants) will voluntarily attend Smart Farming discussion group meetings, to learn from other farmers how they can reduce farm costs by €8,700 and lower their climate impact by 10%.

The IFA's National Environment Committee, who devised and continue to develop the Smart Farming programme, is a real example of how farmers themselves are creating their own solutions to addressing the dual challenges of improving farm returns while enhancing the rural environment.

The collaboration with the EPA as lead partner in this programme and with Teagasc, UCD, SEAI and so many others, demonstrates the depth of knowledge and expertise we have in Ireland and the ambition of stakeholders to deliver change. Over the coming years Smart Farming must continue to evolve to address the continuing farm income and agri-environmental challenges.

There is no room for complacency and IFA will continue to support the development of the worthwhile Smart Farming programme.

Joe Healy
IFA President



In the foreword to the sixth State of the Environment report published by EPA in 2016, I emphasised the need for a greater sense of urgency in making the transition from a society and economy dependent on fossil fuels and the wasteful consumption of natural resources to one that uses renewable and clean energy and that takes much greater care of our precious and non-renewable natural resources.

That transformational change will affect how we work, live, travel, heat our homes, produce our food and use our purchasing power as consumers and citizens. Importantly, there are opportunities to be gained by becoming leaders in this necessary transition to a low carbon and resource efficient economy and by making sure that this transition is underpinned by a clean, healthy and well-protected environment.

The Smart Farming programme is an example of practical leadership in this transition and is resulting in the realisation of tangible gains for the environment, health and the local economy with lasting impacts on farm returns. This is good for the farm families that volunteer to participate in the Smart Farming programme and for their neighbours with whom the results of the studies are shared. This in turn provides an opportunity for the resource efficiency measures identified to be adopted more widely and for promoting enduring behaviour change that will benefit the whole community.

The EPA is pleased to be a lead partner with IFA in the implementation of Smart Farming as an important resource efficiency programme as it continues to make a very positive impact on our environment and our wellbeing.

Laura Burke
EPA Director General



1

Longford farmer Andrew McHugh and his son Daniel took the Smart Farming cost saving challenge and identified €9,000 worth of savings.

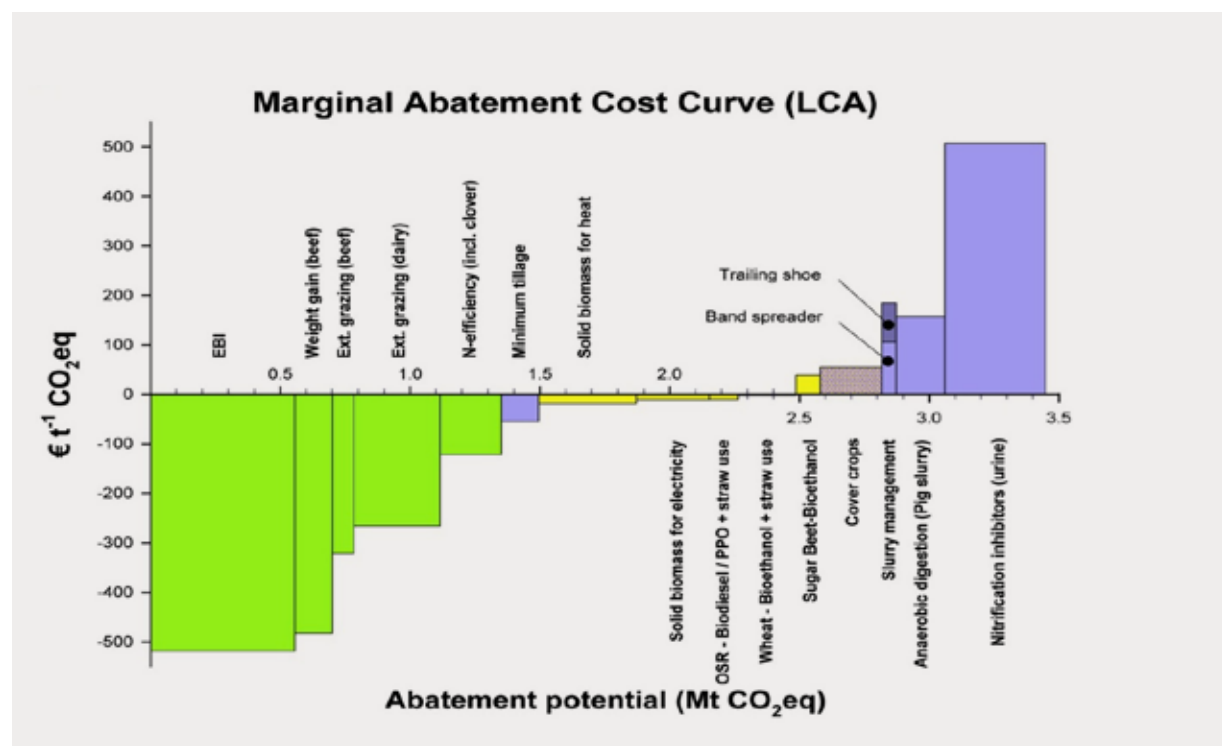
1: What is Smart Farming?

Smart Farming is a voluntary resource efficiency programme led by the Irish Farmers' Association, in conjunction with the Environmental Protection Agency.

The programme collates existing knowledge and expertise from Ireland's leading academic and advisory bodies, state agencies and technical institutions. It communicates this knowledge in a targeted way, to deliver on the double dividend of improving farm returns and enhancing the rural environment through better resource management.

The programme's scientific foundation is derived from Teagasc's *Marginal Abatement Cost Curve* (MACC) for Irish agriculture (Figure 1.1). This cost curve quantifies the opportunities to reduce agricultural greenhouse gases, as well as the associated costs or benefits.

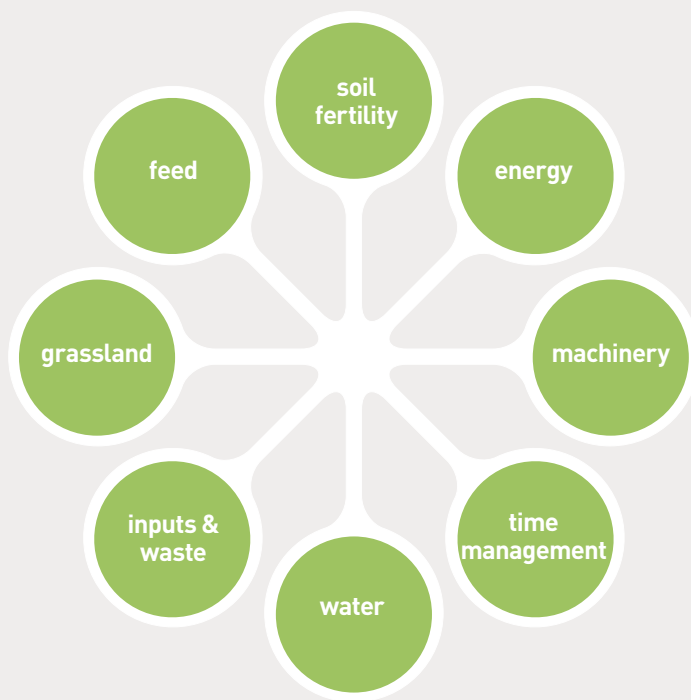
Figure 1.1 Marginal Abatement Cost Curve, based on Life Cycle Assessment Analysis



Over 80% (c.2.8 Mt CO₂eq.) of the measures identified are considered to be cost-efficient, i.e. the adoption of these measures are good for the environment and also saves farmers money.

The development of the Smart Farming resource efficiency programme and identification of the eight focus areas (Figure 1.2) of the programme were strongly influenced by this research.

Figure 1.2 Smart Farming focus areas



The Teagasc *MACC* research and *Four Well-Beings of Community Sustainability* (Figure 1.3) continue to be at the centre of all Smart Farming's activities. This community sustainability model advocates that society can have a long-term positive impact on the wider environment and their own well-being, when environmental needs are better aligned with the economic, social and cultural needs of individuals, in this case - farmers. Thus Smart Farming is focused on improving farm returns and enhancing the environment, operating through accepted cultural communication norms such as discussion groups, IFA branches and purchasing groups.

Figure 1.3 Four Well-Beings of Community Sustainability



Smart Farming – improving farm returns

Each farmer who participates in the Smart Farming programme receives a resource efficiency assessment (REA) of their farm, which is also called a cost saving study. These REAs are completed by a qualified agronomist who has a minimum level 8 qualification and is an agricultural science graduate.

In preparation for the REAs, the participating farmers submit the following information to the Smart Farming agronomist:

- House / farm electricity & fuel bills (heating & diesel) for the previous 12 months.
- Results of soil samples that may have been taken in recent years and the farm map showing where they were taken.
- Any nutrient management plan completed in the last 2 – 3 years.
- Copy of the most recent Basic Payment Scheme application form (without details of the value of the Basic Payment, as this is not required).
- Copy of BPS maps sent from the Department of Agriculture, Food and the Marine.
- Land Parcel Identification Numbers.
- Water:
 - Water bills for previous 12 months (if using water supply other than own well).
 - Results of any water quality tests.
- Feed - dockets for the previous 12 months.
- Results of the most recent silage tests.

Using this information, the Smart Farming agronomist prepares a draft REA, which focuses on identifying average cost savings on each participating farm of €5,000. This is delivered by focusing on the eight themes of soil fertility, inputs and waste, grassland, feed, energy, machinery, time management and water - as identified in figure 1.2.

The net cost savings identified often require an initial investment. For example, an expenditure on lime may be required to address underlying soil pH issues, in order to maximise grass growth and reduce more expensive concentrate requirements. Therefore, the cost savings identified in the draft REA will also include the likely payback period, so that the farmer can determine whether it is reasonable, when considered against the investment required.

The agronomist then completes a farm walk with each participating farmer. This is used to examine the information provided and to get a more complete understanding of particular areas of farm management including the grassland reseeding plan, approach to feed purchasing, energy management and nutrient management.



The Smart Farming agronomist prepares a draft REA, which focuses on identifying average cost savings on each participating farm of €5,000.

The REA is then finalised and discussed with the participating farmers, in advance of the REA being disseminated to the host farmer's discussion group, IFA branch or purchasing group.

At the discussion group meeting (Figure 1.4 overleaf), the completed REA is presented by the Smart Farming agronomist and the host farmer. Robust and challenging exchanges usually take place, during which the recommendations in the REA are questioned and debated.



Figure 1.4 Smart Farming discussion group meetings

- 1 Navan Discussion Group
- 2 Donegal Dairy Group
- 3 3Cs South of Lee Discussion Group
- 4 Newbliss Clones Discussion Group
- 5 Emyvale Discussion Group

“The follow-on discussion with my neighbours here on the farm was a great way for us to learn from one another”

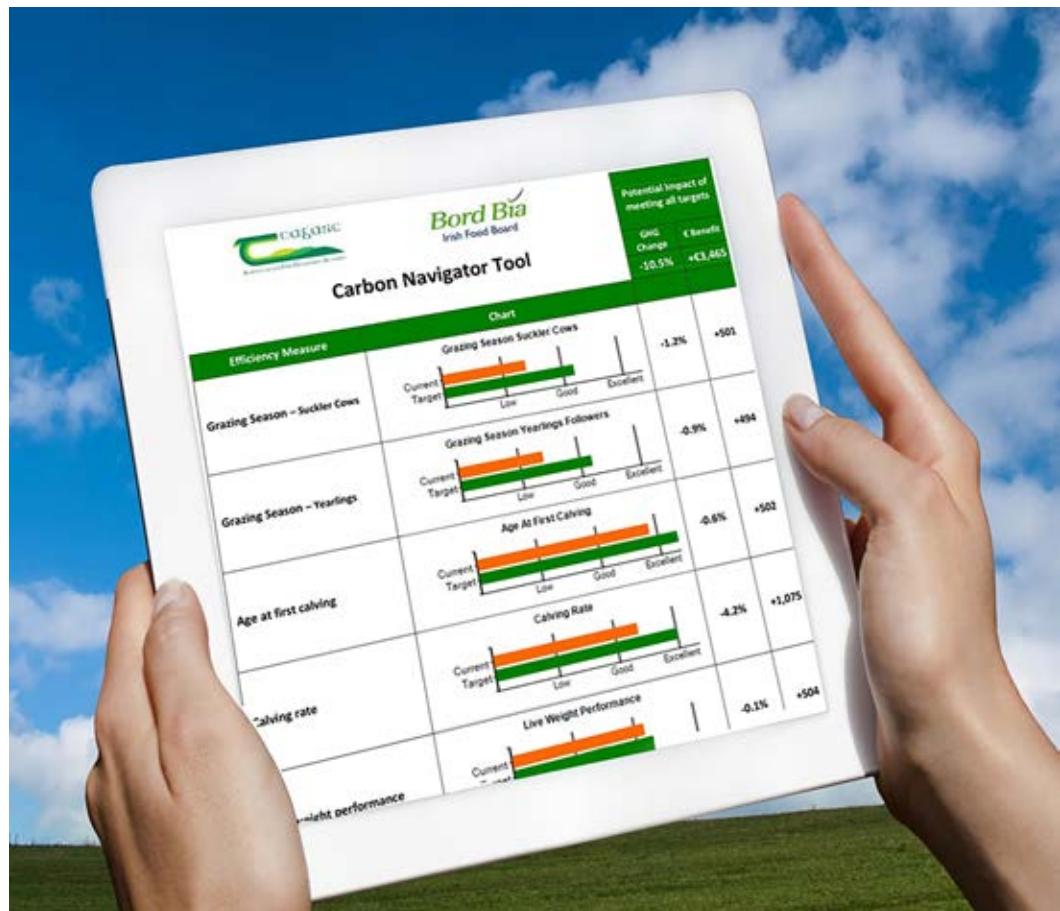
Christy McKenna, Emyvale Discussion Group

Smart Farming – enhancing the environment

As part of the REAs, participating farmers receive a suite of environmental indicators for their farms.

A carbon reduction strategy for each farm is developed, using the Carbon Navigator (Figure 1.5) decision support tool developed by Teagasc and Bord Bia. The Carbon Navigator provides an estimate of greenhouse gas emission reductions that can be delivered on each participating farm, by achieving the targets which are set.

Figure 1.5 Teagasc and Bord Bia Carbon Navigator



Soil tests are also taken and a nutrient management plan for each participating farm is completed, using the Teagasc Online Nutrient Management Planning tool. Maps are generated, indicating the existing soil fertility levels, and liming and fertiliser requirements.

The quality of the water from the domestic water well and quality of the silage is also analysed. Recommendations are provided regarding feed management strategies arising from the results of the silage tests.



The Teagasc and Bord Bia Carbon Navigator provides an estimate of greenhouse gas emission reductions that can be delivered on each participating farm.

Smart Farming – stakeholders collaborating to make a difference

A unique aspect of Smart Farming is the enthusiastic willingness of farmers, representative organisations, academia, advisory bodies, technical institutions and state agencies (Figure 1.6) to collaborate and share their knowledge and expertise in a targeted way to deliver change. The focus of this collaboration is a desire to improve farm incomes and enhance the rural environment, through better resource management.

Figure 1.6 The agencies that make the Smart Farming difference



Smart Farming experts (Figure 1.7 – see page 14) from these organisations continue to significantly enhance the efficacy and standard of resource efficiency messages communicated to farmers. These individuals devised and developed the scientific, agronomic and economic content of each of the eight themes on the Smart Farming website, www.smartfarming.ie. They also contributed to a comprehensive Smart Farming guide, which provides top-tips on how to save money on feed, fertiliser, energy and water bills; as well as ideas on reducing waste and the environmental impact.



Smart Farming – farmers making the real difference

The most important part of the Smart Farming programme is that farmers themselves continue to lead the programme's evolution.

The National Environment Committee (Figure 1.8) of the Irish Farmers' Association, which comprises of farmer representatives from every county in Ireland, has taken an *adaptive leadership approach* when developing this programme and dealing with the agri-environmental issues facing the sector.

They recognise the challenges in terms of air, water, soils, climate and other areas within farming and have moved beyond a standard enforcement and compliance approach. The Committee established the eight focus areas (Figure 1.2) of the Smart Farming programme; expanded the initial cost saving focus to incorporate environmental indicators; proofed the guide and all national communications; as well as participated in the studies. They also support the Smart Farming Programme Leader and Manager in continuing the collaboration with others to deliver on better resource management, which will improve farm returns while enhancing the rural environment.

Figure 1.8 (top) IFA National Environment Committee on water mini-catchments study trip and (below) planning meeting in Teagasc Johnstown Castle



Figure 1.7 Smart Farming experts who developed the Smart Farming cost savings guide and provided the technical data for the eight themes on the Programme's website www.smartfarming.ie

Tommy Boland, University College Dublin

From a mixed farming background in North Wexford, Tommy Boland is currently Associate Professor of Ruminant Nutrition in UCD. His teaching and research interests centre on enhancing the sustainability of ruminant production systems with a particular focus on improved animal health, and reducing methane emissions and nitrogen losses to the environment.

Harold Kingston, Irish Farmers' Association

Harold is the current chairman of Cork Central IFA and a member of the EPA Advisory Board. He was the first Smart Farming programme leader. He is a dairy farmer from Summerhill, Courtmacsherry, Co. Cork and supplies Barryroe Co-op.

Jane Brogan, Environmental Protection Agency

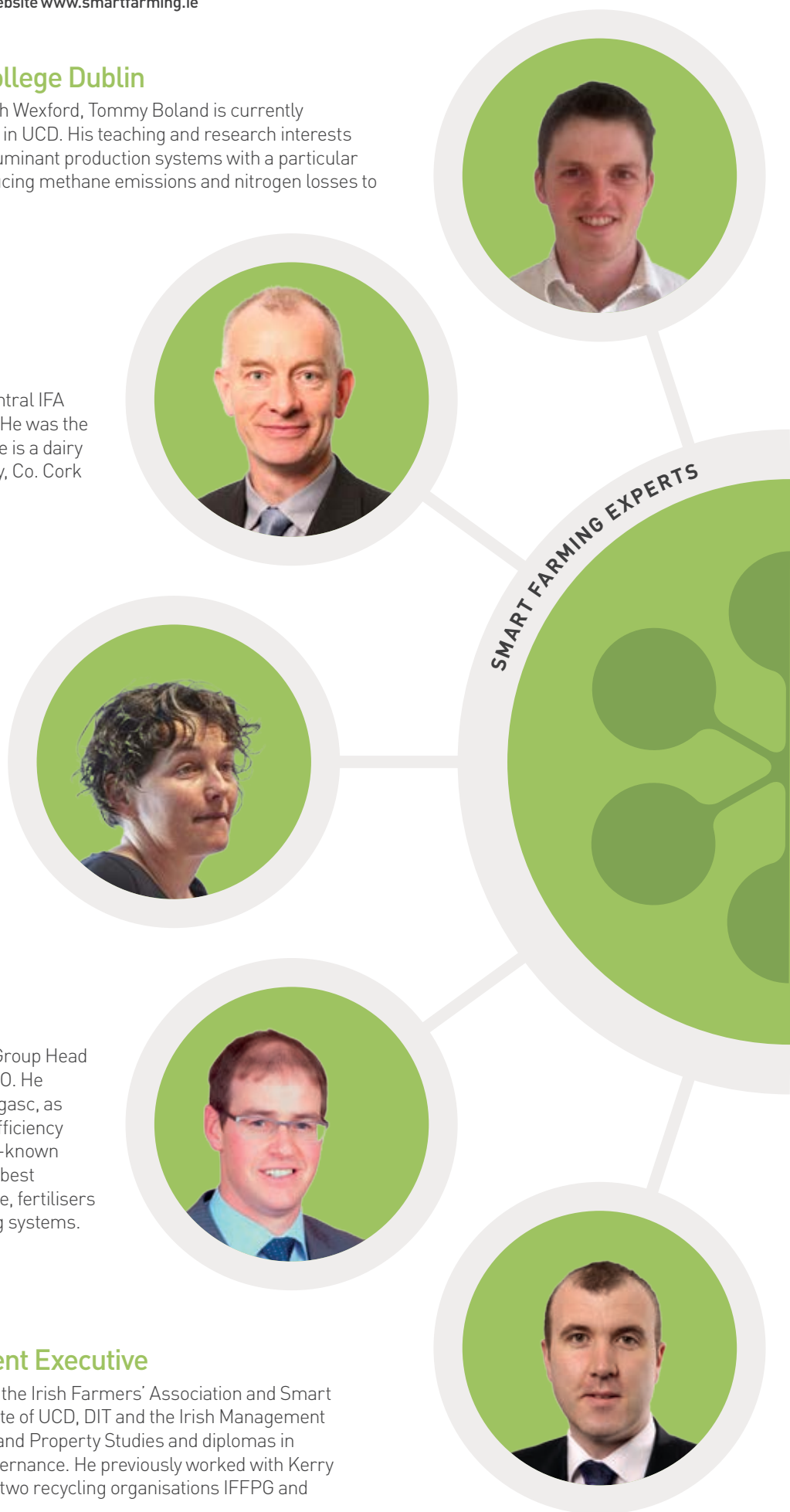
Jane works in the Resource Efficiency Unit of the EPA, focusing on agriculture, and is based in Wexford. Her responsibilities include the Smart Farming initiative; the national farm hazardous waste collection scheme; guidance to farmers on waste prevention and minimisation; the development of agricultural, fisheries and forestry waste models; as well as land-spreading and soils.

Stan Lalor, Grassland AGRO

Dr. Stan Lalor, a native of Co. Laois, is the Group Head of Speciality Business with Grassland AGRO. He formerly worked for over 10 years with Teagasc, as a Research Officer on Soils and Nutrient Efficiency at Johnstown Castle, Wexford. He is a well-known advocate of agronomic and environmental best management practices for soil fertility, lime, fertilisers and manure management for Irish farming systems.

Thomas Ryan, IFA Environment Executive

Thomas is the Environment Executive with the Irish Farmers' Association and Smart Farming's Programme Manager. A graduate of UCD, DIT and the Irish Management Institute, he has degrees in Agri Business and Property Studies and diplomas in Business Management and Corporate Governance. He previously worked with Kerry Group plc and currently represents IFA on two recycling organisations IFFPG and Farm Plastic Recycling CLG.





Brian MacDonald, National Federation of Group Water Schemes

Brian has been the Research & Evaluation Officer with the National Federation of Group Water Schemes since 2002 and is principal spokesperson for the community-owned rural water sector. He edits the quarterly magazine Rural Water News and has published several information booklets to assist schemes in the management of their drinking water supplies from source to tap. He has a particular interest in promoting strategies for sensible and defensible measures to prevent the contamination of drinking water sources.

Gary Ryan, Farm Tractor Machinery & Trade Association

Gary is Chief Executive of the Farm Tractor Machinery & Trade Association, which is over 100 years in business. There are currently over 200 members of the association and it is managed by a group of 17 voluntary executive council members, all of whom work in the industry either as owner/managers or senior officers in their respective companies. The current FTMTA President is Graham McHugh.

Padraig French, Teagasc Moorepark

Padraig is Head of Livestock Systems Department and Dairy Enterprise Leader with Teagasc, based in Moorepark. His current research includes: dairy and beef farm systems, dairy farm infrastructure, farm financial performance, profitable dairy farm expansion and greenfield dairy farm conversion. He is a past president of the Irish Grassland Association.

Ivan Sproule, Sustainable Energy Authority of Ireland

Ivan Sproule, based in SEAI regional office in Sligo is Programme Manager for the SME and Large Industry Programmes in SEAI. Through these programmes he manages all supports offered to the largest energy users in Ireland and to SMEs. He recently developed and delivered two new grants schemes, the Smart Lighting pilot for SMEs and Dairy Farm pilot funding variable speed drives on vacuum pumps and milk pumps on dairy farms.

Jim Dockery, Farm Relief Services

Jim is the Training Manager at FRS Training and farms a Towra Pedigree Angus Herd. Jim has been part of the FRS Team for over 30 years. He became National Health & Safety Manager in 1999 and is currently Manager of FRS Training. Jim has vast farming experience and has a particular interest in promoting farm safety at all levels in Agriculture. He is an active member of the Health & Safety Authority Farm Safety Partnership.



2

Smart Farming farmer Aidan McGrath and members of the Ballyhooley Discussion Group, Cork discuss the results of their Smart Farming study with IFA's Billy Cotter.

2: Smart Farming results for 2017

In 2017, average cost savings identified on participating farms was €8,700. This exceeded the Programme's objective of identifying savings of €5,000, by 74%.

The average greenhouse gas emissions reduction identified on the participating farms was 10%. This also surpassed the Programme's objective of identifying a 5-7% reduction on participating farms.

Cost savings identified

Similar to previous years, farmers met the Smart Farming team on the IFA stand, at the National Ploughing Championship and other agricultural shows throughout the summer and autumn of 2016 and registered their interest in taking part.

Cost saving studies were completed on 38 farms in the counties set out in figure 2.1. This provided a regional spread of activity and complemented studies completed in previous years.

Figure 2.1 Counties where Smart Farming studies were completed in 2017



The average cost savings identified by the Smart Farming agronomists was €8,700. However, the actual savings (Figure 2.2) ranged between €2,345 and €23,342. These cost savings also varied in each county, as seen in Figure 2.3.

Figure 2.2 Cost savings range

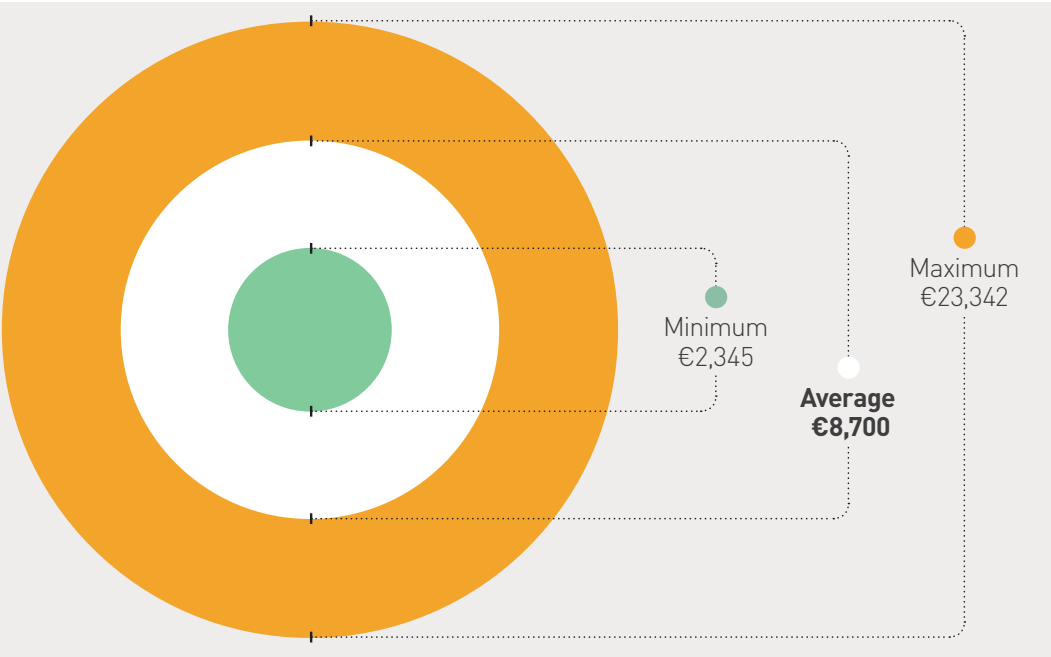
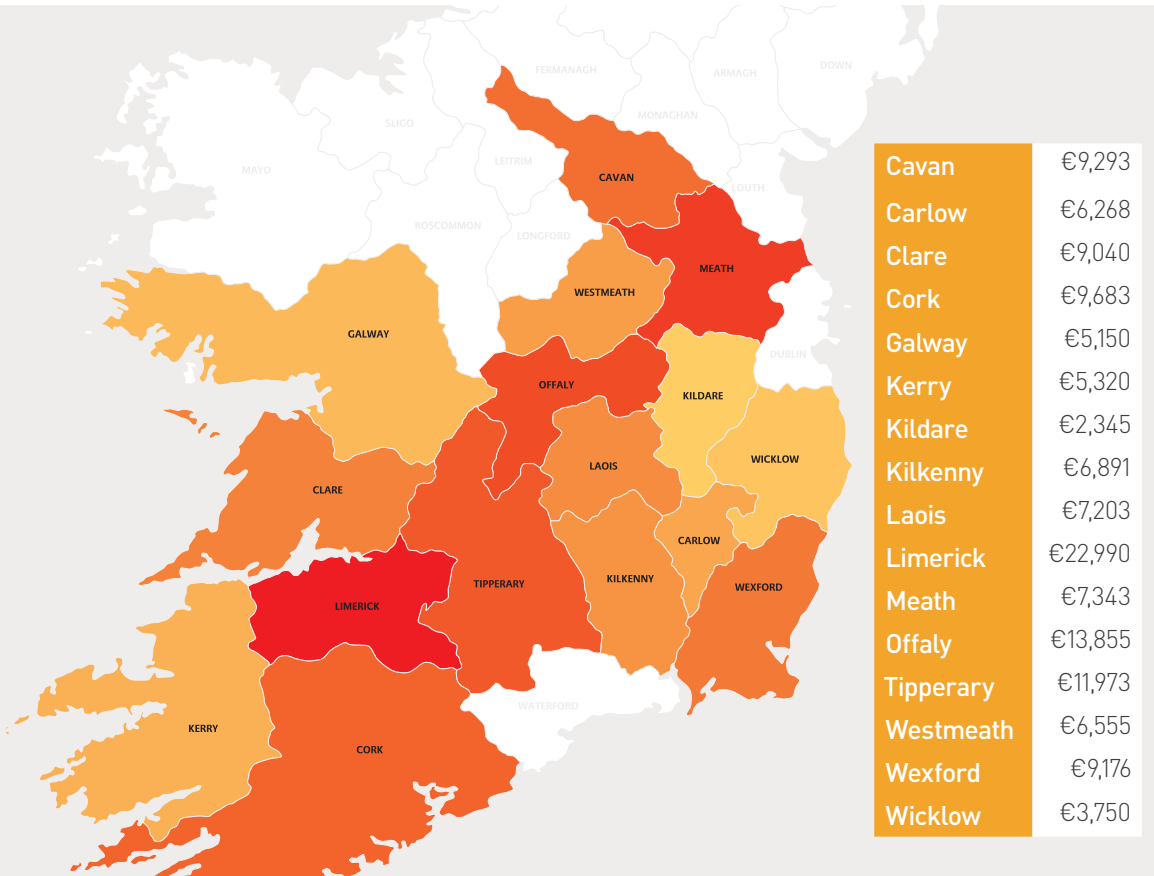


Figure 2.3 Average cost savings in each county



The largest cost savings were identified on dairy farms (Figure 2.4), at €10,200.

Figure 2.4 Cost Savings by farm enterprise type

Farm enterprise	Average savings per farm (€)
Livestock (beef & sheep)	€6,900
Dairy	€10,200
Overall savings	€8,700



The Smart Farming studies identified that addressing soil fertility represents the largest (47%) cost savings across all farm types. The production potential of the grasslands on these farms is being limited by the fact that 87% of soils samples were at sub-optimum fertility levels.

Soils at the optimum phosphorous (P) Index of 3 will yield more grass dry matter (approximately 0.6 tonnes per acre) than grass at a sub-optimal level of P Index 1. This extra grass could be worth approximately €180 per acre, given that feeding good quality grazed grass is almost four times cheaper than concentrates. Managing soil fertility ensures that soils are ready to take up the fertiliser nutrients. This improves crop growth and reduces risk of run-off.



Good grassland management was also identified as an important area to reduce costs representing 21% of the overall savings. The Smart Farming studies highlighted the importance of grass budgeting, turnout dates, regular reseeding and the management of swards after reseeding.



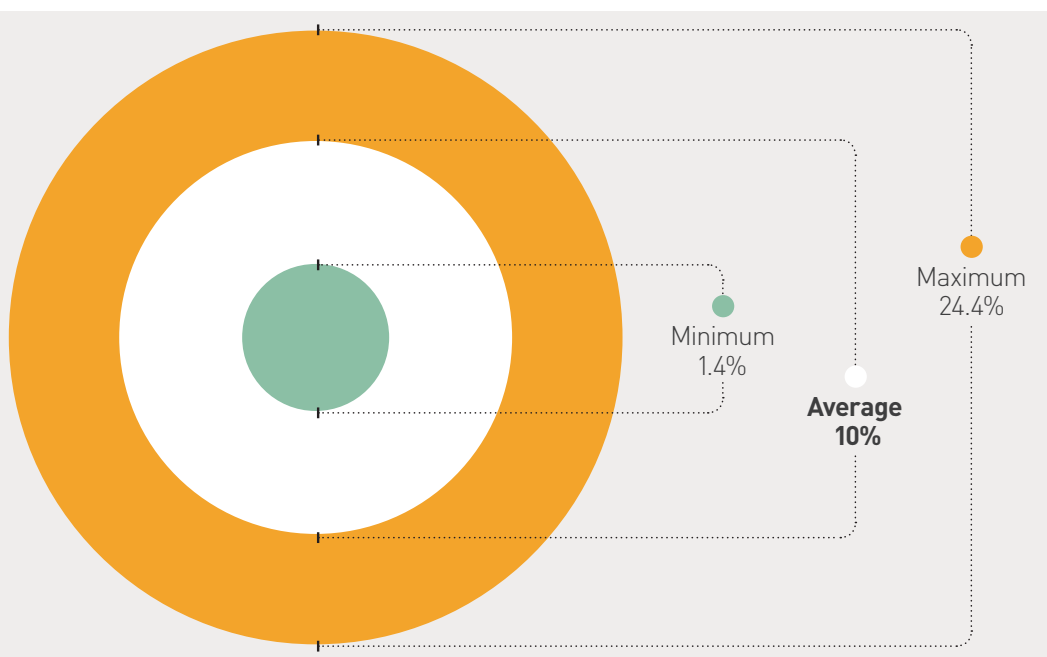
The management of feed costs represents 16% of the remaining cost savings identified. The cost saving studies analysed silage quality, advised on the importance of feed budgets, emphasised the importance of correcting mineral deficiencies and knowing the energy value when buying feedstuffs.

Environmental improvements

Carbon reduction strategies were developed for participating farmers, using the Carbon Navigator decision support tool developed by Teagasc and Bord Bia.

The greenhouse gas emissions reduction identified varied (Figure 2.5), with an average reduction in GHGs of 10% identified. There was no significant variation between enterprise type.

Figure 2.5 Range in greenhouse gas emissions reduction identified



Increasing genetic merit through Economic Breeding Index (EBI), which is a profit index aimed at helping farmers to source the most profitable bulls and cows for breeding, was identified in the Smart Farming studies as being the measure that could reduce greenhouse gas emissions the most. The carbon navigator user manual developed by Teagasc identifies the following advantages of increasing genetic merit via EBI:

- Improving fertility reduces calving intervals and replacement rates, thus reduces enteric methane emissions per unit of product.
- Increasing milk yield per unit of grazed grass and improving milk composition increases the efficiency of production, which decreases emissions per unit of product.
- Earlier and more compact calving increases the proportion of grazed grass in the diet and reduces culling and replacement rates.
- Improved survival and health reduces deaths and disease incidences, lowers replacement rates and emissions.

Improving calving rates, particularly in suckler herds, were identified in the Smart Farming studies as the second most significant way to reduce greenhouse gas emissions. This measure was advised as the targeted 365 day calving interval was not being achieved on farms. This reduces efficiency, increases costs, and reduces profitability and environmental performance.

Improving nitrogen efficiency on farms was also identified in the Smart Farming studies as a significant way to reduce greenhouse gas emissions and reduce risk of run off to water courses. Teagasc's carbon navigator user manual advises that nutrient efficiency can be increased through:

- The increased use of clover in swards.
- Improving soil fertility.

- Improved grassland management and utilisation.
- Improvements in the timing and application of fertiliser nitrogen.
- The application of the most appropriate nitrogen fertiliser type for the prevailing conditions.

This guidance on improving nitrogen efficiency is supported in the cost saving studies by the completion of nutrient management plans, using Teagasc's online nutrient management planning tool. Maps (Figure 2.6) are generated for participating farmers, indicating the existing soil fertility levels and liming and fertiliser requirements, as part of the Smart Farming reports received by farmers.

Figure 2.6 Nutrient planning maps provided to farmers

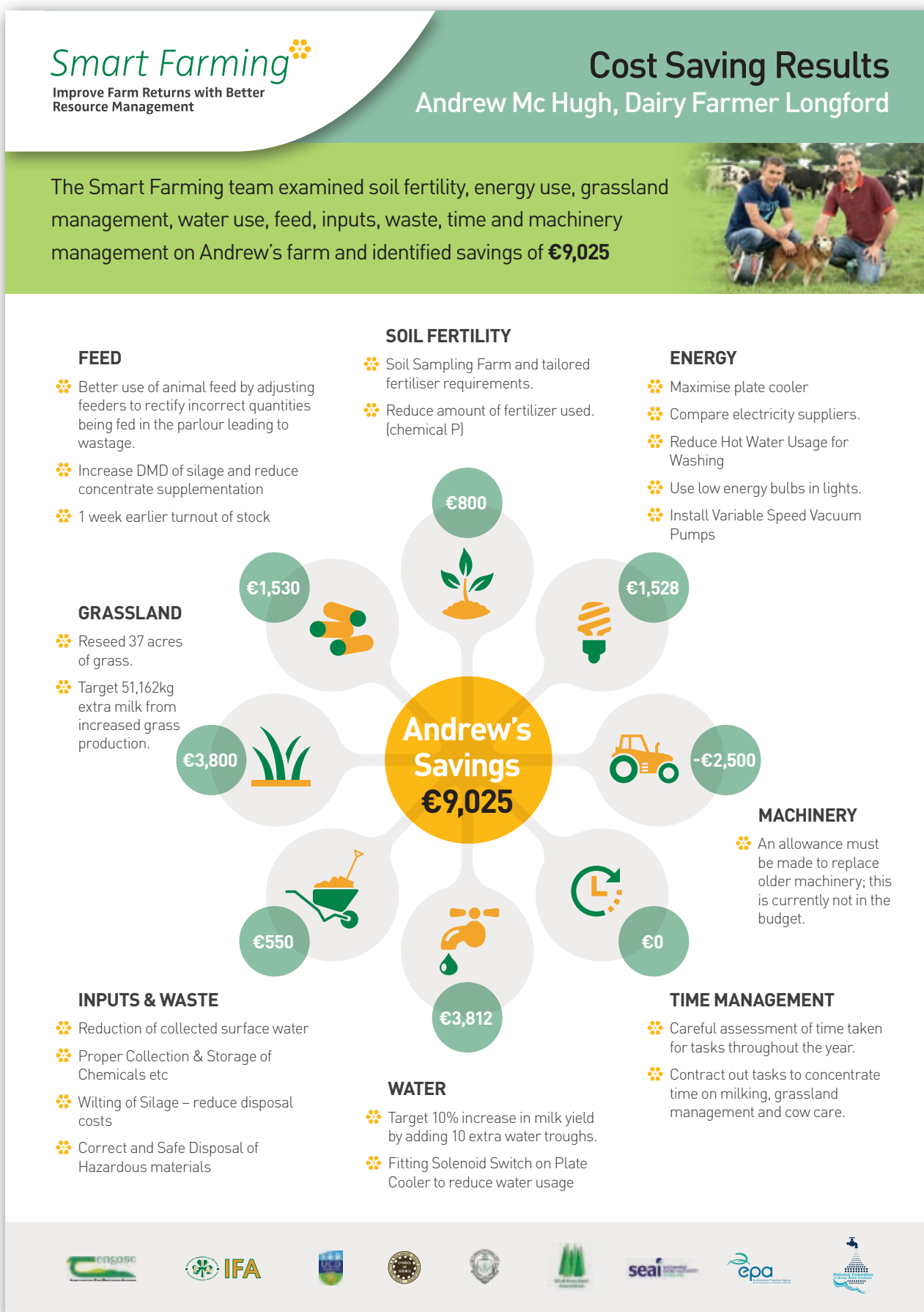


These plans improve nutrient management on the farms and assist the farmers to deliver their production targets, reduce their greenhouse gas emissions and reduce the risk of run-off to water courses.

Other environmentally positive and resource efficiency indicators reported in the Smart Farming studies included extended grazing season (where weather and soil conditions are appropriate), age of cows at first calving, live weight performance and timing of slurry spreading.

Case studies from Smart Farming's activities were subsequently uploaded onto the Smart Farming website and published (Figure 2.7 - overleaf).

Figure 2.7 Smart Farming case studies in the press



The Smart Farming team examined soil fertility, energy use, grassland management, water use, feed, inputs, waste, time and machinery management on Peter's farm and identified savings of **€8,317**



GRASSLAND

- If topping paddocks this should be done immediately as the animals leave as any later and the new growth will be removed from the sward
- Aim for 2 week earlier turn out of animals

ENERGY

- Consider improving attic insulation
- Compare electricity suppliers
- Use low energy bulbs in lights

SOIL FERTILITY

- Tailored fertiliser and lime requirements
- Target fertiliser use and avail of alternative sources of organic fertilisers (Saving €27 per 1000 gallons)
- Rent/lease out excess land to maximise stocking density potential to 170kgN/ha on remaining land (Rent out 20ha @ €300/ha)

MACHINERY

- Turn tractor engine off rather than leaving the engine idling (6%).
- Alter tyre pressure according to work type, soil or weather conditions (20%).
- An allowance must be made to replace older machinery; this is currently not in the budget.

FEED

- Take silage samples
- Increase DMD of silage and reduce concentrate supplementation

INPUTS & WASTE

- Reduction of collected surface water
- Proper collection and storage of chemicals etc.
- Wilting of silage which in turn will result in reduced effluent disposal costs
- Correct and safe collection and disposal of waste and hazardous materials

WATER

- Ensure adequate water supply for livestock to ensure sufficient supplies at all times.

TIME MANAGEMENT

- Careful assessment of time taken for tasks throughout the year.
- Contract out tasks to concentrate the farmer's time on grassland management and livestock care.





3

George and Ruth Hatton and their son David from Kilmeany, Co Carlow took the Smart Farming challenge in August. They identified €7,682 in cost savings and ways to reduce their climate impact by 6%.

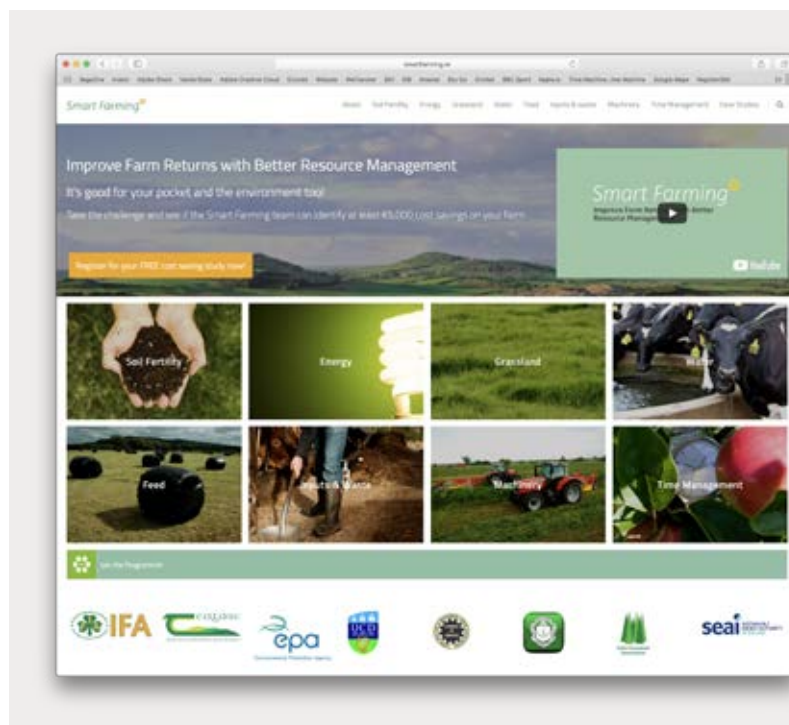
3: Communicating the Smart Farming message

Increasing awareness and encouraging participation in the Smart Farming programme is important to maximise the benefits for farmers and the environment. This is being done through a variety of platforms.

Online

Smart Farming has a dedicated website - www.smartfarming.ie (Figure 3.1), which was redesigned in 2016. The website is now compatible across various communication platforms including desktops and mobile devices.

Figure 3.1 Smart Farming website www.smartfarming.ie



A Smart Farming introductory 4 minute video was also developed and uploaded to YouTube www.youtube.com/watch?v=_aXWsgbvGo. This video outlines the background to the Smart Farming programme, refers to the collaborating partners and sets out the steps involved in completing a resource efficiency cost saving assessment. Contributors to the video include farmers that have previously participated in the programme; Dr. Karina Pierce from University College Dublin; Jane Brogan from the EPA; Eileen O'Leary from the Clean Technology Centre CIT and Harold Kingston from the Irish Farmers' Association.

In addition to the introductory Smart Farming video, separate and shorter videos were developed and uploaded onto YouTube for specific resource efficiency areas such as energy, grassland management, feed and soil fertility.

Smart Farming's activities, updates and newsfeeds are regularly communicated via the twitter handle @ifamedia. Figure 3.2 provides an indication of some farmers, individuals, organisations, agencies and Government Departments that liked or retweeted the Smart Farming message during 2017.

Figure 3.2 Some who liked or retweeted the Smart Farming message during 2017



In print

The Smart Farming resource efficiency assessments and cost saving studies are generally completed between April and August each year. To coincide with this, national advertorials (Figure 3.3) are published each month which typically provide:

- An update regarding the programme's activities.
- Seasonal technical advice. For example, the May advertorial provided advice from Teagasc on making good quality silage.
- A message from a participating farmer in the programme.
- Cost savings and environmental improvements identified.



Shows and seminars

During 2017, Smart Farming was fortunate to be asked to take part in several shows and seminars (Figure 3.4). These events were used to communicate the economic and environmental benefits of better resource management. They also provided useful platforms to encourage farmers to register their interest in participating in the 2018 programme.

Figure 3.4 (above) Smart Farming at the shows and seminars in 2017

1	EPA National Water Conference , Co. Galway. David O'Dwyer Smart Farming, Dr. Matthew Crowe Director EPA, Thomas Ryan Smart Farming Programme Manager.
2	Energy in Agriculture , Co. Tipperary. IFA's James Murphy, Environment Minister Denis Naughten T.D. and Smart Farming agronomist Aoife Smith.
3	Teagasc's international RAMIRAN manure management conference , Co. Wexford. Teagasc's Gary Lanigan and Owen Carton with Thomas Ryan Smart Farming Programme Manager.



6



7



8



9

4

Tullamore Show, Co. Offaly. Thomas Cooney Smart Farming Programme Leader, Pat Deering T.D. Chair of Agriculture Oireachtas Committee, Aoife Smith Smart Farming agronomist, Sean O'Leary IFA National Dairy Chairman.

5

Agricultural Science Association climate seminar, Co. Laois. Thomas Ryan Smart Farming Programme Manager, Leanne Roche Teagasc, Mary Delaney ASA President and Prof. Tommy Boland UCD.

6

Airfield Estate Education Day, Co. Dublin. IFA's Harold Kingston talks Smart Farming with secondary school students.

7

National Ploughing Championships, Co. Offaly.

Smart Farming agronomist Mark McConnell and Programme Leader Thomas Cooney, Phil Hogan EU Agriculture and Rural Development Commissioner and Joe Healy IFA President.

8

Joe Healy IFA President and Smart Farming Programme Leader Thomas Cooney with Michael Creed T.D. Minister for Agriculture, Food and the Marine.

9

National Economic and Social Council's knowledge transfer study, Co. Wexford. Alan Poole Smart Farming participant discusses the programme with NESC's Dr. Rory O'Donnell, Larry O'Connell and Jeanne Moore and Prof. Charles Sabel, Columbia Law School, USA.

In Brussels

The European Commission's policy agenda continues to expand, from BREXIT to migration and budgets, including CAP. In addition to these, from an agri-environmental perspective the Circular Economy and the UN's Global Nutrition agendas, Sustainable Development Goals and Paris climate Accord are all driving future policy for farmers.

Smart Farming's implementing partner, the Irish Farmers' Association, cites in discussions with European Commission officials the important role that the Smart Farming programme is playing in addressing the dual challenges of improving farm returns, while enhancing the rural environment.

During 2017, a number of meetings took place with officials from DG AGRI, DG CLIMA and DG ENV, during which the benefits of the Smart Farming programme were highlighted.

(right) IFA and Smart Farming's Thomas Ryan & Thomas Cooney discussing Smart Farming with Simon Kay, DG CLIMA, Brussels.



(below) During a meeting with Andrea Vettori and colleagues from DG ENV, IFA and Smart Farming's Thomas Cooney and Thomas Ryan highlighted Ireland's Smart Farming resource efficiency programme, led by farmers.







4

**"It's about saving
money sustainably"**
William Cassidy,
suckler & sheep
farmer, Maganey,
Co. Carlow.

4: Contributing to policy

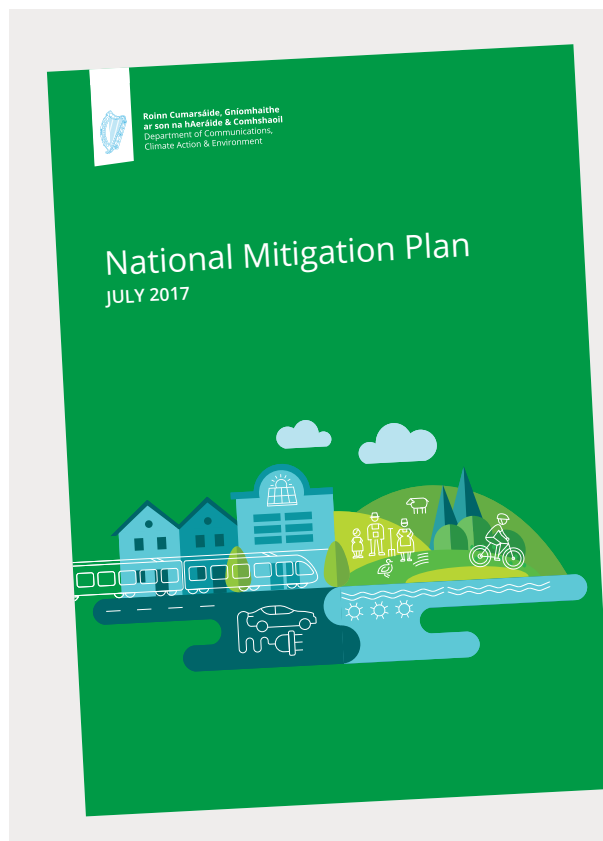
As policy makers seek to address the many environmental challenges including climate change, resource efficiency and water quality, Smart Farming continues to make a contribution to the policy debate and is having a real and measurable impact.

Climate change

Ireland's National Mitigation Plan

In July 2017 An Taoiseach Leo Varadkar, T.D. and his Government colleagues Denis Naughten, T.D. Minister for Communications, Climate Actions and Environment, Michael Creed, T.D. Minister for Agriculture, Food and the Marine, Eoghan Murphy, T.D. Minister for Housing, Planning and Local Government and Shane Ross, T.D. Minister for Transport, Tourism and Sport published Ireland's first statutory National Mitigation Plan (Figure 4.1).

Figure 4.1 Ireland's National Mitigation Plan



The National Mitigation Plan sets out a vision to achieve a transition to a low carbon and climate resilient future, in which each and every one of us has a role to play.

Smart Farming is recognised in the National Mitigation Plan as playing its part and “supports the measurement, monitoring and improvement of the environmental performance of farms.”

UN FAO Global Alliance on Climate-Smart Agriculture

In 2016, the Department of Agriculture, Food and the Marine, provided an opportunity for Smart Farming to contribute to the Annual Forum of the United Nations Food and Agriculture Organization's (UN FAO) Global Alliance on Climate-Smart Agriculture (GACSA) (Figure 4.2).

Figure 4.2 Thomas Ryan, Smart Farming's Programme Manager speaking at the UNFAO



The mission of the GACSA is to address the challenges facing food security and agriculture by tapping the wealth and diversity of resources, knowledge, information and expertise, from and between its members, in order to stimulate concrete initiatives at all levels. At the Annual Forum, Ireland's Smart Farming programme was highlighted as an example of a national voluntary initiative, which collaborates with key stakeholders to address both farm income and environmental challenges.

The GACSA works towards three aspirational outcomes, which are similar to Smart Farming's. They are to:

- Improve farmers' agricultural productivity and incomes in a sustainable way.
- Build farmers' resilience to extreme weather and changing climate.
- Reduce greenhouse gas emissions associated with agriculture, when possible.

GACSA aims to catalyze and help create transformational partnerships to encourage the three pillars of Climate-Smart Agriculture (CSA) – productivity, adaptation and mitigation.

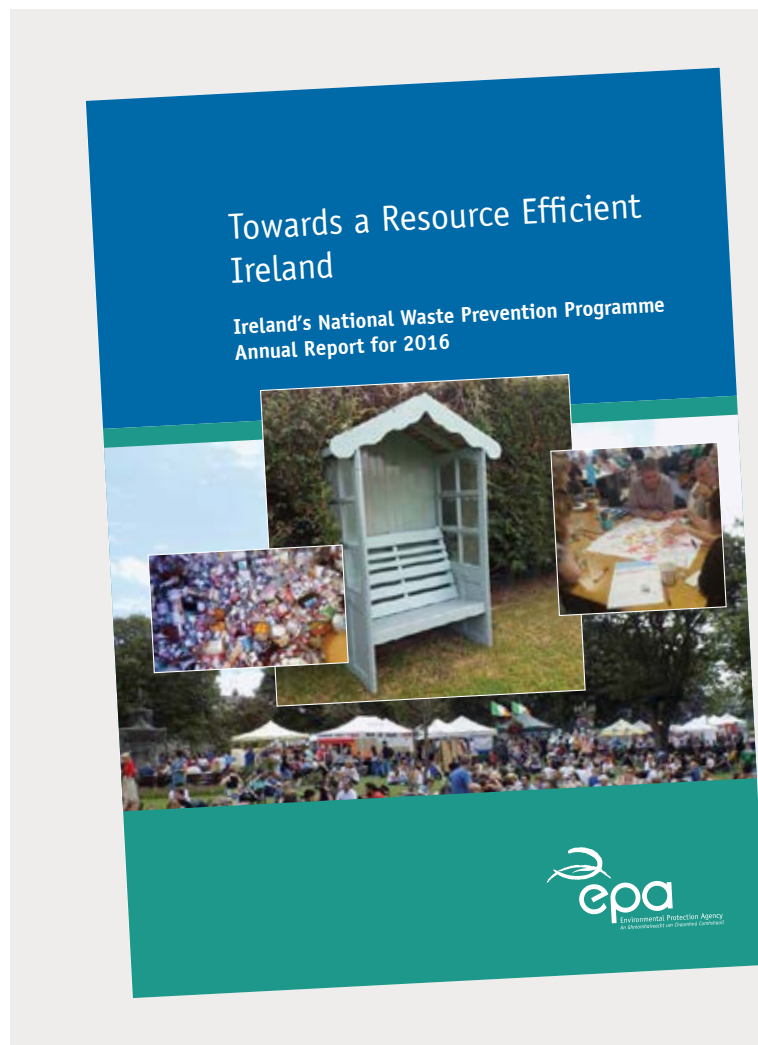
Resource efficiency

The National Waste Prevention Programme (NWPP), which is guided by the Environment Protection Agency, plays a key enabling role in supporting businesses, households and the public sector to be more resource efficient in Ireland.

The NWPP acts as a catalyst for the implementation of the United Nations (UN) Sustainable Development Goals (SDGs), in particular Goal 12 and its associated targets, which are focused on responsible consumption and production.

In its annual report for 2016 *Towards a Resource Efficient Ireland*, (Figure 4.3), which was published in 2017, the NWPP highlights the role of Smart Farming in building resource efficiency capacity in the agriculture sector.

Figure 4.3 EPA's *Towards a Resource Efficient Ireland* report

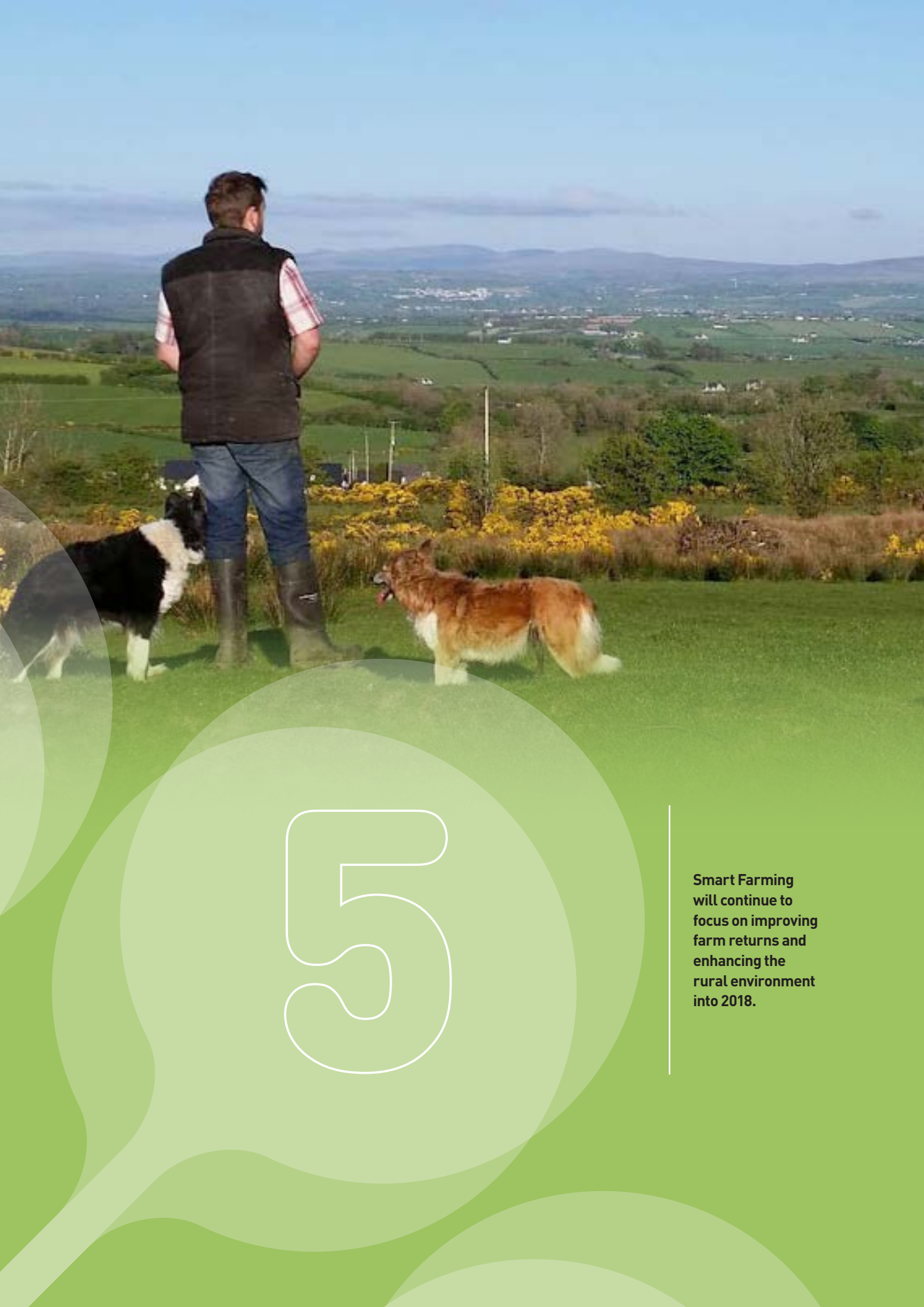


Water

During 2017 Smart Farming's implementing partner, the Irish Farmers' Association (IFA) made submissions to the Departments of Agriculture, Food and the Marine and the Department of Housing, Planning and Local Government.

These submissions were in response to consultations regarding the review of the Nitrates Regulations and the second cycle of River Basin Management Plans. Using Smart Farming as an example, IFA advocated for an alternative approach to delivering water compliance. This approach is based on working with rural communities to build capacity to respond to water challenges, rather than exclusively using traditional enforcement and penalty methods.

The most recent inter-departmental and inter-agency Nitrates Review Group's recommendations include the development of a collaborative approach, involving State agencies and the farming sector, aimed at bringing about change within the farming sector in order to achieve sustainable farming practices and positive environmental outcomes.



5

Smart Farming
will continue to
focus on improving
farm returns and
enhancing the
rural environment
into 2018.

5: What to expect in 2018

Smart Farming will continue to focus on improving farm returns and enhancing the rural environment into 2018. Below are the key areas the programme will concentrate on:

- Improved farm return
- Reduced greenhouse gas emissions
- Nutrient planning
- Water quality
- Decision support tools for farmers
- Biodiversity
- Case studies

Improved farm return

In April 2017, IFA President Joe Healy and Smart Farming Programme Leader Thomas Cooney launched the 2017 Programme (Figure 5.1) with the goal of identifying average cost savings of €5,000 on participating farms. This figure was surpassed by €3,700.

Figure 5.1 Smart Farming 2017 programme launch



The graphic features the 'Smart Farming' logo with a stylized orange flower icon. Below the logo is the tagline 'Improving farm returns. Enhancing the environment.' A photograph shows three men in outdoor attire crouching in a field, examining a plant. To the right, a green box contains the headline '€250,000 in savings across 50 farms in 2017'. Below this, text describes the programme's scope (1,000 farmers across 50 discussion groups) and objectives (identify an average of €5,000 cost savings per farm). It also lists environmental benefits (reduced greenhouse gases, lessened risk of run-off, improved water quality) and provides a website for practical ideas and case studies. A small arrow points to a caption at the bottom left of the green box.

Smart Farming
*Improving farm returns.
Enhancing the environment.*

€250,000 in savings across 50 farms in 2017

Smart Farming, the IFA led cost savings programme will work with more than 1,000 farmers across 50 discussion groups, purchasing groups and IFA branches in 2017.

The objective is clear: identify an average of €5,000 cost savings on each of the 50 farms.

Added environmental benefits include reduced greenhouse gases, lessened risk of run-off and improved water quality.

Get some practical ideas and case studies on how you can save money and enhance the environment at www.smartfarming.ie

← Smart Farming Cost Saving Challenge begins in Carlow. Smart Farming participant William Cassidy, IFA President Joe Healy and Smart Farming Project Leader Thomas Cooney.

Smart Farming will maintain similar guidance for 2018 and will work towards identifying a further €5,000 cost savings on each of the farms that participate during the year.

Reduced greenhouse gas emissions

In 2017, as part of the Smart Farming programme, a carbon reduction strategy for participating farmers was developed, using the Carbon Navigator decision support tool developed by Teagasc and Bord Bia.

Potential to reduce greenhouse emissions by 10% on average was identified. Results from individual farms were uploaded onto the Programme's website (www.smartfarming.ie).

Figure 5.2 Example of carbon reduction strategy received by participating farmers in 2017

George and Ruth Hatton and their son David from Kilmeany, Co Carlow took the Smart Farming challenge in August. They identified **€7,682** in cost savings and ways to reduce their climate impact by **6%**.

Reducing the climate impact by 6%

During the Smart Farming Cost Saving Study, a carbon reduction strategy for the Hatton's farm was developed using the Carbon Navigator decision support tool developed by Teagasc and Bord Bia.

Potential to reduce greenhouse gas emissions by 6% was identified. Many of the measures, such as nitrogen efficiency and slurry spreading timing will also lead to other positive environmental outcomes and reduce risks to water quality. Let's take a closer look at the Carbon Navigator results.

Measure	Action	Greenhouse Gas Changes
Grazing season – Suckler cows	Target to turn-out 10 days earlier in spring and turn-in 7 days later in autumn	-1.5%
Grazing season – yearlings/followers	Target to turn-out 15 days earlier in spring and turn-in 15 days later in autumn	-1.1%
Age at first calving	On target of 26 months	-0.6%
Calving rate	Potential for calving interval to be improved	-2.5%
Live weight performance	On target – 1130g/day of age	-0.1%
Nitrogen (N) efficiency	Small reduction in chemical N spread.	-0.5%
Slurry spreading timing	Increase % spring application by 10%	0%
Total		-6.3%

The average of 10% reduction in greenhouse gas emissions identified in 2017 is considered as being at the upper-end of expectations. However, the Programme will maintain a guidance of identifying a further average of 10% in greenhouse gas emissions in 2018.

Nutrient planning

Farmers who participate in the Smart Farming Programme in 2018 will have their soils tested and receive information on soil fertility levels, pH levels and fertiliser requirements. The water quality of domestic wells will also be analysed.

Tailored nutrient management plans will also be developed using Teagasc's Nutrient Management Planning tool. The plans will include colour coded maps, which optimise soil fertility. This will provide for an overall focus on safeguarding water quality and appropriate fertiliser management.

Water quality

The Local Authority Waters and Communities Officers (LAWCO) play an important role in supporting the development of local voluntary measures for improving water quality.

They also have technical expertise, particularly in the area of breaking pathways between source and water course. During 2018, Smart Farming will engage with the LAWCOs to better understand how farm incomes and environmental performance can be positively impacted by better management of the pathway between source and water courses.

Decision support tools for farmers

In September 2017, Peter Linden began his UCD Smart Farming Masters in Agricultural Innovation Support.

The task for Peter is that he will use his academic endeavours to develop decision support tools, which will assist farmers to interpret silage and water quality test results in a timely way. The decision support tool is also expected to provide guidance for actions to be taken, having interpreted the results.

Smart Farming will work with UCD throughout 2018, to support Peter to deliver a Masters which enhances his learning, but also begins the process of delivering the water and silage decision support tools required by farmers.



Get to know Peter Linden

Peter is from a dairy & beef farm in south County Monaghan. He recently commenced the Masters in Agricultural Innovation Support programme in collaboration with Smart Farming and the UCD School of Agriculture & Food Science. Peter graduated from Dundalk Institute of Technology, in conjunction with Ballyhaise Agricultural College, this year with a Bachelor of Science (Honours) degree in Sustainable Agriculture. He has a passion for farming and agriculture, which has been nourished from a very young age. He is delighted to be part of the Smart Farming and UCD research team and looks forward to the new challenges ahead.

Biodiversity

In 2018, discussions will take place with agencies including the National Biodiversity Data Centre and the team involved in University College Dublin's Smart Grass programme. The aim is to improve an understanding of the ecosystems' goods and services provided by biological diversity and their integration into the Smart Farming programme, to deliver improved returns and environmental performance for farmers.

Case studies

With the consent of participating farms, the results of more cost savings studies and resource efficiency assessments of individual farmers will be published and uploaded onto the Smart Farming website (<http://smartfarming.ie/case-studies/>). This continues to be an important tool for disseminating outputs of the programme.



6

Robert Watson and his daughter Heidi from Stradone, Co Cavan took the Smart Farming challenge in July. They identified €5,990 in cost savings and ways to reduce their climate impact by 20%.

6: Governance and finance

Smart Farming has an annual budget of approximately €100,000. This is primarily used to fund the completion of on-farm resource efficiency assessments, cost saving studies and environmental indicators for each participating farm. This includes the completion of a carbon reduction strategy, nutrient management planning, water and silage quality analysis.

In 2017, a cost savings to expenditure ratio of 3:1 was delivered, with overall cost savings of €332,000 identified on the participating farms. In addition, average greenhouse gas emissions reduction of 10% on participating farms were identified.

Funding for the programme is supported by EPA's national waste prevention programme. Regular meetings and contact takes place between IFA and the EPA to ensure that Smart Farming's work programme, devised by the IFA National Environment Committee, continues to build resource efficiency capacity in the agriculture sector; identify ways to enhance the environment and deliver the associated improvement in farm returns.

The IFA's National Environment Committee has oversight responsibility for the programme, which is delivered by the Programme Leader and Programme Manager. The Programme Advisor ensures alignment takes place between Smart Farming's activities and the objectives of the National Waste Prevention Programme and wider environmental responsibilities.

Reports and operational updates are regularly prepared for Government Departments and state agencies.



In 2017, a cost savings to expenditure ratio of 3:1 was delivered, with overall cost savings of €332,000 identified on the participating farms.



In addition, average greenhouse gas emissions reductions of 10% on participating farms were identified.



7

Smart Farming
training day on
McHugh's farm in
Longford.

7: The people who make the Smart Farming difference

Smart Farming's success is built on the collaborative willingness of so many people to focus on improving farm returns and enhance the rural environment through better resource management.

Smart Farming is grateful to so many, including the following people, for their contributions to the programme.

Smart Farming 
*Improving farm returns.
Enhancing the environment.*



Thomas Cooney
IFA & Programme Leader



Thomas Ryan
IFA & Programme Manager



Jane Brogan
EPA & Programme Advisor



IFA

The Team that guides the Programme: IFA National Environment & Rural Affairs Committee





Teagasc experts who provided technical advice during 2017



Mark Plunkett



Brian Garry



David Wall

Others who provided technical advice during 2017



Brian McIlvenna



Eileen O'Leary



Mark McConnell



Agronomists who completed the Resource Efficiency Assessments & Cost Saving Studies



Philip Farrelly



Freda Salley



Aoife Smith



Facilitated Smart Farming to be presented at the UN FAO Global Alliance on Climate Smart Agriculture



John Muldowney

Apologies to those we have not included here and should have. Please let us know by emailing smartfarming@ifa.ie or 01-4260343.



8

Smart Farming
Programme Leader
Thomas Cooney and
Sligo IFA County
Chairman JP Cowley
congratulate liming
competition winner
Trevor Boland
Dromard, Sligo.

8: Thank you

To the farmers who continue to participate in this voluntary initiative and share their cost saving results with their neighbours to effect change, thank you.

You are the bedrock of Smart Farming's continued success.

The Smart Farming team will continue to challenge ourselves to be innovative and relevant, so we can keep on improving farm returns, while enhancing the environment through better resource management.

We are grateful for the resources and technical expertise provided by so many of Ireland's leading agriculture and environmental experts to the Smart Farming programme over the years.

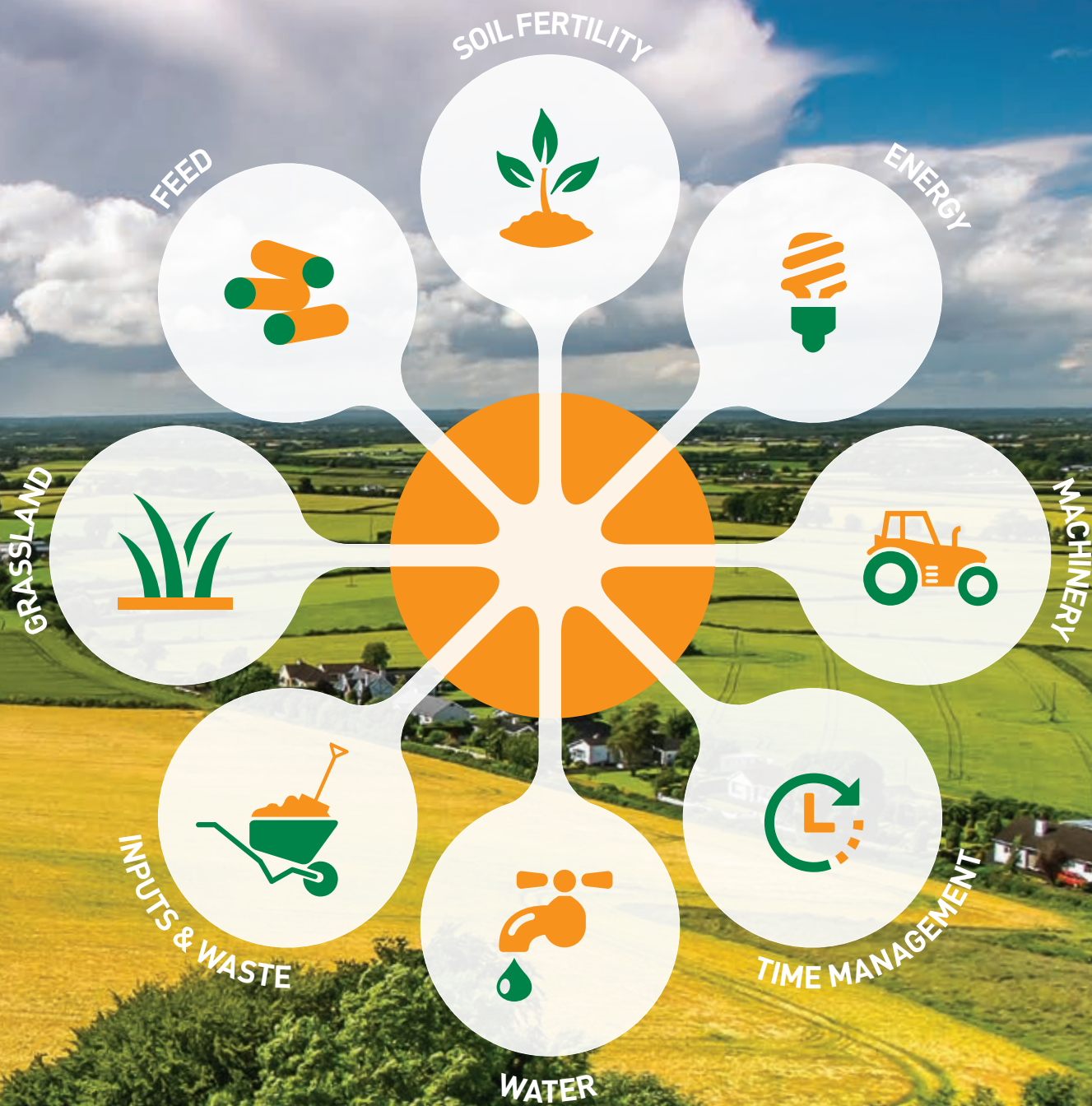
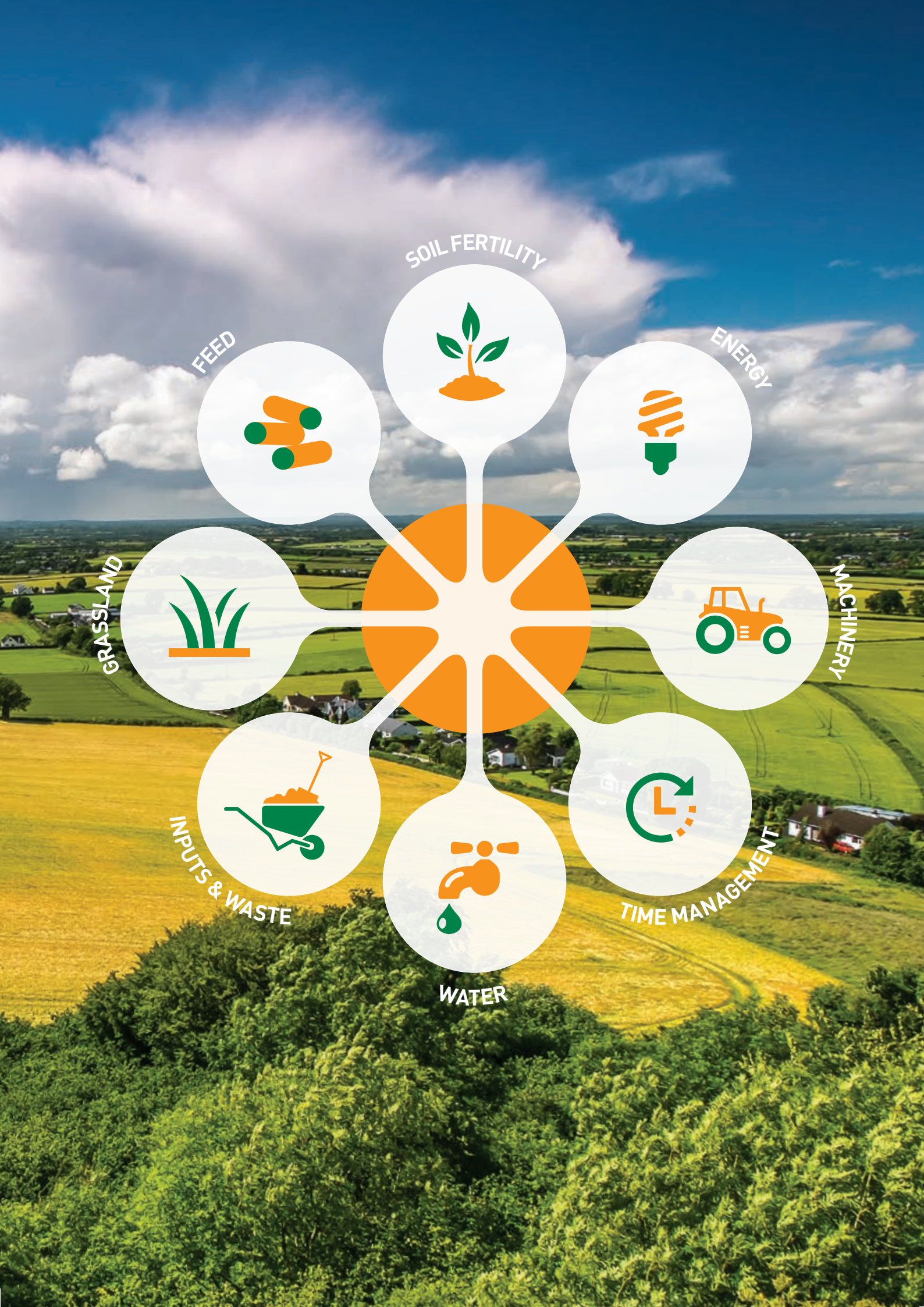
To the staff and officers of the IFA and EPA who have embraced this programme and are driven to making a difference - a final thank you.

Smart Farming really does demonstrate that collaboration can make the real difference.

Smart Farming

*Improving farm returns.
Enhancing the environment.*





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Enhancing the environment.

