Golf Course 2030

Great Britain & Ireland

An industry roadmap addressing challenges from, and taking opportunities presented by, the changing climate, resource constraints and regulation to secure optimal golf course condition and playability for current and future generations.

December 2020

Golf Course 2030.

R&A

Golf Course 2030

Great Britain & Ireland

Contents

INTRODUCTION TO GOLF COURSE 2030

The main objective of Golf Course 2030 is for industry stakeholders to agree on a roadmap that secures optimal golf course condition and playability for current and future generations by addressing challenges from, and taking opportunities presented by, the changing climate, resource constraints and regulation. The roadmap needs to meet strategic needs at regional, national and local level, and the operational needs at golf facility level.

The remit for Golf Course 2030 is the condition and playability of the main in-play areas on the golf course, from tee to green, including fairways, bunkers, green approaches and surrounds, and the primary rough. However, the roadmap will also need to highlight any impact of outcomes on biodiversity, the local community and the multi-functional capacity of the green space.

Golf Course 2030 seeks to bring the golf industry together to clearly identify the challenges and opportunities facing those developing, designing, building and managing golf courses with regards to the changing climate, increasing resource constraints, and the regulations agenda.

Golf Course 2030 centres on a range of realistic scenarios, from business as usual to, effectively, a doomsday prediction of disruption from extreme weather, water scarcity, high resource costs and limited chemical availability. In this challenging environment it is impossible to see how we can maintain the playing conditions we enjoy today without technological breakthroughs, and changes in attitudes and behaviours amongst many of the sport's stakeholders, including golf club owners, golfers, managers and greenstaff.

In addition to the production of the roadmap, Golf Course 2030 aims to prepare the sport for what may be difficult times ahead; to help ensure that current strategies and solutions are effective; to uncover new solutions which can mitigate some of the challenges; and to make the most of opportunities that arise to enhance course condition and playability.

The process for achieving the objective of Golf Course 2030 will bring stakeholders together to:

- raise awareness of the potential impact of the challenges and opportunities on course condition and playability
- agree priority issues within a region or country

- undertake analysis of current strengths and weaknesses in knowledge and understanding; practitioner education; tools for information dissemination, club engagement, knowledge sharing, tracking of progress, consumer awareness and external relations
- devise and implement forward plans across key areas of strategy
- review progress on agreed priorities and goals, and once successfully addressed, move on to other issues
- engage with decision makers at golf facilities to ensure that proposed solutions are implemented
- highlight the key role to be played by course management staff in delivering an optimal standard of golf course condition and playability.

In this way, Golf Course 2030 will build upon and guide the future development of existing industry solutions and association initiatives, including those that:

- disseminate engaging messages and raise awareness
- engage and support clubs through the provision of best practices, analytical tools, golfer engagement materials and recording of key performance data
- enable credible reporting of evidence of industry best practice and industry progress
- facilitate knowledge sharing
- recognise credible leadership activity in course management.

An overview of Golf Course 2030 is available on The R&A website here.

What is optimal course condition and playability?

Optimal course condition and playability is a subjective and variable term. It reflects the potential for any golf course to provide year-round access to firm playing surfaces which are fit for purpose. The potential of any course will be limited by many factors. Optimal condition and playability could be considered as:

Optimal course condition and playability = Potential x [Site conditions + Design + Construction + Resources (machinery, manpower, materials) + Quality of Decision-Makers/Management + Weather + Golf Objective + Amount of golf/maintenance traffic + Revenue + Regulation]

The Golf Objective in this equation reflects the target market of the course and this can range from Championship standard (challenging), through Recreational standard (appealing to all golf handicaps), to Beginner standard (introductory level to the sport, with limited challenge), or any combination of these standards.

Optimal performance delivers the potential of a course for as much of the year as possible and as consistently as possible.

The optimal performance in terms of the condition and playability of any golf course will vary through fluctuations of the limiting factors, e.g. seasonal weather. Different types of courses will be more or less prone to some of the fluctuations, e.g. thanks to their natural drainage qualities, links will tend to retain greater consistency in terms of optimal performance than will parkland through periods of wetter weather.

GOLF COURSE 2030 STAKEHOLDERS

The industry stakeholders to be engaged in the Golf Course 2030 process can be divided into 'Core' and 'Supporting' groups:

Core Stakeholders

- National Governing Bodies
- Group representative or if not available an experienced individual of the key decision-makers at golf facilities i.e.:
- Facility management club, course and golf, e.g. general/club manager (Club Manager Associations), course manager/superintendent (Greenkeeper/Superintendent Associations) and director of golf/club professional (Professional Golfer Associations)
- Course owners
- The R&A
- Professional Tours

Supporting stakeholders

- Dedicated 'Golf and Sustainability' Partners
- Agronomists and other relevant consultants
- Golf Architects
- Researchers
- Golf developers or builders
- Educators
- Commercial suppliers
- Golfers (amateur and professional)
- Golf media

The initiative also needs to engage with external stakeholders, such as other sports (including the Olympic movement), Government, NGOs, the general public and non-golf media.

The GB&I industry stakeholders are:

The R&A
England Golf
Confederation of Golf in Ireland
Scottish Golf
Wales Golf
BIGGA
GCSAI
GCMA
CMAE
UK Golf Federation
PGA
EIGCA
STRI
RIPTA
GEO Foundation
European Tour
Ladies European Tour
SRUC Elmwood
Myerscough College
Crop Protection Association
Agricultural Engineers Association
Irrigation Consultants
British Society of Plant Breeders
Turfgrass Growers Association
Amenity Forum
University of St Andrews
BASIS
Labosport
FEGGA

DRIVERS FOR ADAPTATION

There are considered to be three main drivers impacting on our ability to secure optimal golf course condition and playability for current and future generations; climate, resources and regulation. Golf Course 2030 must assess how the impacts of climate change, availability of resources and increasing depth of regulation will affect day-to-day operations at the golf facility.

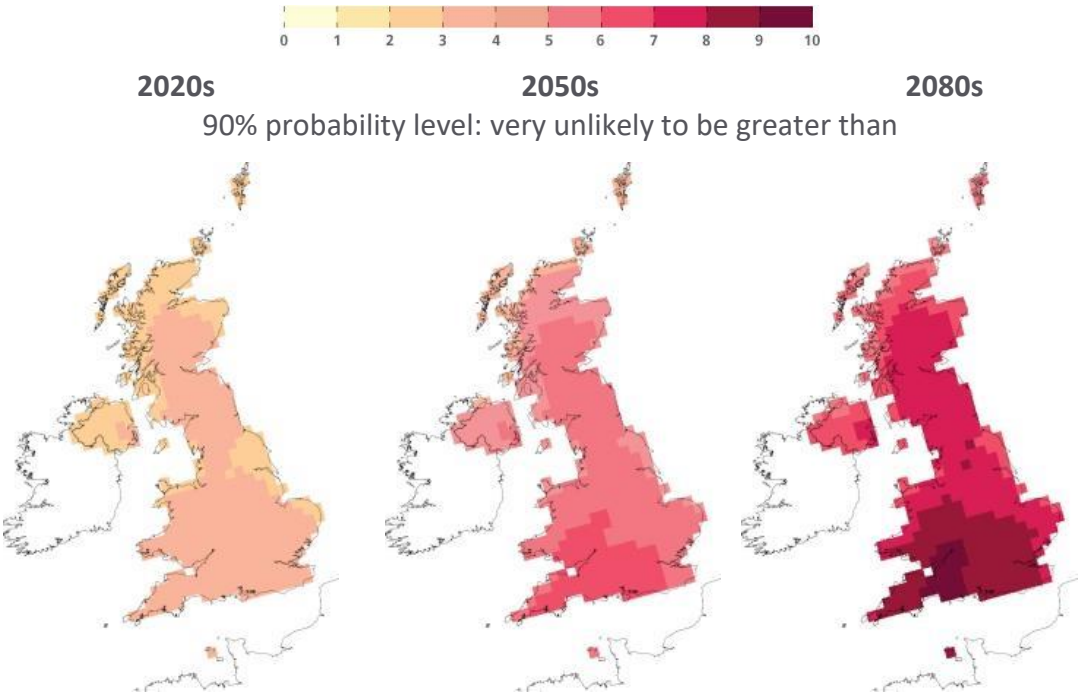
1. Climate

Changes in the climate and more climatic extremes cause problems for course managers[1]. Turf does best in an environment with limited variability, and changes in weather patterns will result in the need for course management to adjust to such circumstances. Climate predictions for the UK[2] suggest that there will be changes to our weather patterns such as:

- Increase in the frequency of hotter, drier summers (see images below). Having a sustainable source of water for irrigation will become increasingly important.
- Increase in winter precipitation and increase in river flow, which will result in more flooding and associated turf management problems
- Milder winters, which will result in a longer growing season and changes in disease, pest and weed incidence
- Sea-level rise and increased risk of coastal flooding, which will impact on coastal golf courses.

These weather patterns have an impact on course condition and playability, e.g. coastal erosion, damage from flood waters and associated detritus, pressure on irrigation water supply, changes to the frequency and type of disease incidence and the influence on biodiversity. Different types of courses, e.g. links and parkland, will not be affected the same by all of the predicted changes in climate and weather patterns. Their impact may also vary on the different areas of the golf course, i.e. greens, green surrounds, fairways, tees, bunkers and rough. They might also impact on the golf business through increased costs in trying to mitigate effects or reduced revenue as a result of weather unsuited to outdoor pursuits. The changing climate will require adaptation in how we manage our golf courses. The UK Climate Change Act 2008[3] sets the target for the net UK carbon account for the year 2050 at least 80% lower than the 1990 baseline. It also looks at the impact of and adaptation to climate change.

Change in summer mean maximum temperature (ºC) Medium emissions



2. Resources

The resources considered essential for today's golf course are likely to become scarcer and cost more. This applies to water, pesticides, fertilisers, sand, energy, labour, etc. Resource use on the golf course varies dependent on the type of course, e.g. links or parkland, and on the intensity of management related to the area of the course being treated. A golf hole (see image to left) is made up of a number of different areas, which tend to receive different levels of treatment.

The greens (1 on image) are the most intensively managed part of the golf course, yet only take up around 1 hectare of the 60 hectares of an average 18-hole golf course. Fairways (2) are less intensively managed but cover around 16 hectares, so any single input will amount to a greater quantity than a similar application to greens. The teeing grounds (3) and green approach/surround (4) are each of a similar area as the greens and generally receive an intermediate level of management between that of the greens and that of the fairways. The bunkers (5) are a sand-filled hazard, whose number can vary on any individual golf hole. The maintained rough (6) receives very limited management, mainly mowing. Up to 50% of the area of a golf course can be natural habitat, providing a haven for wildlife.

Under this driver, the golf facility itself needs to be considered as a resource in how it contributes towards issues such as community (multi-functionality), health/well-being, and biodiversity.

3. Regulation

Often directly related to resource issues, water, pesticide and biodiversity regulations are already having an impact on course condition, playability and cost. Regulation on other issues such as fertilisers, energy and waste will also influence the future management of our golf courses. As with the other drivers, the impact of regulation will vary dependent on the type of course, e.g. links or parkland, and on the intensity of management related to the different parts of the course.

Legislation in GB&I will need to be considered when assessing impacts on course condition, playability and cost and in devising potential solutions to regulation-led limiting factors.

The main legislation in the UK and Ireland likely to impact on golf course condition and playability has been transposed from the European Union Directives on Water[4] and the Sustainable Use of Pesticides[5]. These are:

Water

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003
The Water Environment (Controlled Activities) (Scotland) Regulations 2011
The Water Environment and Water Services (Scotland) Act 2003
The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003
European Communities (Water Policy) Regulations, 2003 (Republic of Ireland)
European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (Republic of Ireland)
European Communities Environmental Objectives (Groundwater) Regulations, 2010 (Republic of Ireland)
European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (Republic of Ireland)

In terms of water supply to golf facilities, regulation is contributing to:

- Increasing cost of public mains and abstraction sources
- Abstraction licences being more difficult to obtain and on less generous terms
- Restrictions in supply and use increasing during periods of shortage
- Monitoring of water quality is increasing, in part as a measure to tackle pollution.

Pesticides

The Plant Protection Products (Sustainable Use) Regulations 2012 (UK)
Plant Protection Products Regulations (Northern Ireland) 2011
S.I. No. 155/2012 – European Communities (Sustainable Use of Pesticides) Regulations 2012 (Republic of Ireland)

For pesticides, regulation is contributing to:

- Greater focus on Integrated Pest Management
- The chemical option in the Greenkeepers toolkit is more limited, with there now being no active ingredients for worm control, no insecticides (other than limited availability through an Emergency Authorisation) and no contact fungicide, which removes the curative approach when disease strikes
- More controls over the sale, storage and use of pesticides.

This legislation is relevant to coastal change and permissions/consents for coastal defence works:

The Coastal Protection Act 1949

A partnership between the Northern Ireland Environment Agency (NIEA) and Scottish Environment Protection Agency (SEPA) provides free environmental guidance for small and medium-sized businesses throughout Northern Ireland and Scotland. This guidance, which includes the key pieces of environmental legislation relevant to businesses, can be accessed through the NetRegs[6] website.

Golf Course 2030 also has to take a global perspective and its objectives are aligned with the UN's 2030 Agenda for Sustainable Development[7]. The United Nations Sustainable Development Goals (UN SDGs) provide a valuable reference and golf can contribute directly to the following goals:

6 Clean Water and Sanitation
Water quality and pollution prevention.

7 Affordable and Clean Energy
Transition to cleaner and renewable energy.

9 Industry Innovation and Infrastructure
Innovation to mitigate against challenges.

12 Responsible Consumption and Production
Safe and responsible use of resources.

13 Climate Action
Adaptation, ecosystem services and carbon sequestration.

14 Life Below Water
Protection of water bodies and their wildlife, pollution prevention.

15 Life on Land
Habitat protection, enhancement of biodiversity and pollution prevention.

17 Partnerships for the Goals
The industry working together so it is speaking with one voice, to ensure that there is commonality of language and messaging.

[1] Game Changer, Climate Coalition, 2018
[2] Met Office UK Climate Predictions
[3] Climate Change Act 2008
[4] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy
[5] Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides
[6] NetRegs website
[7] Transforming our world: the 2030 Agenda for Sustainable Development

FUTURE SCENARIOS

To produce a roadmap that secures optimal golf course condition and playability for current and future generations, there needs to be a consideration of what might be. The drivers for adaption pose many potential scenarios. Presented here are three 2030 scenarios, from business as usual to a potential doomsday prediction of extreme weather, water scarcity, high resource costs and no chemical availability. These scenarios should be related to the current optimal performance of golf courses. It should also be borne in mind that there is a sliding scale between the two extremes cited in scenarios 1 and 3:

Scenario 1. Limited change from the environment that now exists as alternative technologies, management solutions and behavioural change address the challenges posed by climate, resources and regulations and optimal golf course condition and playability is secured.

Course condition and playability is comparable to that available today. Drivers for change are weak and opportunities to enhance the potential of golf courses, their performance and environment will not be realised. There could be extra costs for golf businesses that position themselves as early adopters of new technologies, which may be passed on to the customer, so golf could be more expensive.

Scenario 2. Severe restrictions in the availability and use of synthetic chemical plant protection products, together with 50% less water being available for irrigation compared with current levels. Alternative technologies, management solutions and behavioural change partially address the challenges posed by climate, resources and regulations.

More months of the year will see greater course closure due to extreme weather events, notably flooding, and more damage and scarring to turf from water and pesticide restrictions, related to hotter summers and wetter winters.

The condition and presentation of surfaces will see periodic troughs, with golfers having to accept a different style of golf and course performance, notably in terms of reduced green speed. There is also the prospect that course condition will improve as turf naturally adapts and firmer surfaces become the norm. Golfers will appreciate and enjoy the seasonal change in course appearance and playability.

There will be increasing pressure on golf facilities to survive as the cost of maintenance increases. This will lead to opportunities for a greater flexibility in course design, e.g. fewer holes, less maintained turf, and an increase in diversification to provide multi-functional green space.

Golf businesses will need to spend more on new technologies and more expensive resources to sustain course condition and playability. Golf will be more expensive to play. Golf facilities will also see a decline in income as deteriorating conditions reduce the attractiveness of the sport, though those that embrace the opportunities for a different type of golf and diversification of land use will thrive.

There will be some course closures, notably those wholly reliant on water and synthetic chemical plant protection products to keep a grass cover, and this will impact on the contribution of golf to the local, regional and national economy.

Scenario 3. The banning of all chemical plant protection products and fertilisers, together with 75% less water being available for irrigation compared with current levels. Alternative technologies, management solutions and behavioural change fail to address the challenges posed by climate, resources and regulations.

There will be longer periods of course closure, damage from extreme weather events and disease/pest/weed incidence and the high cost of resources results in loss of customers and permanent closure of many facilities. There are serious consequences for the contribution from golf to the local, regional and national economy.

The combination of hotter summers and less water being available means that only those with sustainable sources of water for irrigation can retain a reasonable cover of grass. Only those that can afford course renovation, a secure water supply and significant levels of extra labour or automation of certain maintenance practices will be able to cope with these pressures and, even in such situations, golf will be regularly played on inferior surfaces compared to what we enjoy today. The use of artificial turf increases for those that can afford it as the problems in managing natural turf become insurmountable.

PRACTICAL ACTION

Guiding Principles for resilient and sustainable golf courses

There are a number of fundamental, universal practical principles for golf course development and management which extend across the decision-making culture, agronomic practices, and broader considerations of golf's impact on and contribution to nature and local communities. The following is offered as a guide to those in decision-making positions.

1. Plan over the longer-term and operate under consistent policies, which are documented.

2. Prepare for future challenges. Consider the predicted impact of the changing climate (such as flooding, coastal erosion or drought), the availability and costs of vital resources and the constraints placed by regulation.

3. Recognise the professionalism of well qualified course managers and their staff. They will play a vital role in securing optimal course condition and playability.

4. Safeguard the reputation and well-being of employees, employers, golf facilities and the sport itself through strict compliance with the law. Decision makers at golf facilities must support their greenkeepers in adhering to this policy.

5. Create the right environment to produce healthy turf, which is fit for purpose, with adequate access to light and air, and good drainage and a biologically rich growing medium. Select and manage for grass species best adapted to local conditions.

6. Water scarcity and cost are going to be increasing issues for golf. Golf courses should be designed, built and managed to conserve water, using the least required to produce healthy turf and firm playing surfaces. Where feasible, water for irrigation should be generated in situ, through recycling drainage, rainwater harvesting, irrigation reservoirs and other technologies. Where feasible, water derived from non-potable sources should provide the irrigation source. Grass selection should be targeted at species which are fit for purpose, but which require the least amount of irrigation water.

7. The trend is for increasing pressure on pesticide availability and use. It is likely that they will continue to be removed from use. Eliminate reliance on pesticides, identify and transition to alternative solutions to prevent and manage disease, pest and weed problems. Select and manage for grasses which are fit for purpose and which have the greatest natural resistance to disease infection, pest attack and weed ingress.

8. Fertiliser use is likely to be regulated as part of pollution prevention measures. Select grasses which are fit for purpose with minimal nutritional input and use products which offer the greatest protection to the environment.

9. Excessive organic matter accumulation creates weak turf, prone to stress and susceptible to disease infection, pest attack and weed ingress. Management practices used to control organic matter accumulation, e.g. various forms of scarification and top dressing, cause stress to turf. Select and manage for grasses which are fit for purpose, but which have a slow natural rate of organic matter accumulation and implement management practices, i.e. irrigation and fertiliser, responsibly in a manner which minimises organic matter build up.

10. Cutting height has a major influence on turf health and the requirement for maintenance, with over-close mowing inducing turf stress which requires greater water, fertiliser and pesticide inputs to correct. Mowing heights should be implemented to sustain grasses which are fit for purpose, but which are inherently healthy.

11. Energy derived from fossil fuels is going to become more expensive and golf facilities should be transitioning to cleaner, renewable sources of energy. Course design, construction and maintenance should be focused on energy efficiency, utilising grasses which are fit for purpose, but which require the least input of maintenance resource.

12. Disposal of waste to landfill will become increasingly expensive and socially unacceptable. Course design, construction and maintenance should focus on preventing waste and maximising reuse and recycling.

13. Biodiversity loss is a major global concern and golf courses have the potential to conserve and protect wildlife. Golf courses should be designed and managed to provide quality habitat for as wide a variety of native wildlife as possible.

14. Golf has a responsibility to wider society and the design, construction and maintenance of facilities should focus on making a positive contribution to local communities, such as by providing a multi-functional venue for wider community integration and recreation.

15. Objective assessment of the condition of playing surfaces, particularly the putting surfaces, on the golf course is required to monitor the impact of the challenges facing greenkeepers, the implementation of research outcomes and adaptations in management. This could include firmness, smoothness, trueness, reliability, speed, etc.

16. The recording of key resource metrics for course management, e.g. water, chemicals, energy, waste and biodiversity. Sustainability reporting on course operations is required on a facility, country, region and international level. This is necessary to monitor the impact of the challenges facing greenkeepers, the implementation of research outcomes, adaptations in management and compliance with regulations.

PROCESS

The main objective of Golf Course 2030 is to help stakeholders develop a roadmap and specific action plans that will help those developing, designing, building and managing golf courses to address the challenges and opportunities from the changing climate, increasing resource constraints, and the regulations agenda facing the industry over the coming decade. There will be a number of necessary steps in the roadmap towards the production of action plans. The detail of this process will vary depending on the nature of the challenges and opportunities faced by any region, country or facility. Pulling this together should be a collaborative industry effort.

The following process is suggested as a guide:

1. Bring together (or further develop) stakeholder group to ensure the initiative is relevant to the region or country. Ensure group membership is balanced with strategic and technical representation of people focussed on the long-term interests in the future of the sport.

2. Stakeholders identify the challenges and opportunities and agree on priority issues to be addressed over the next 3-5 years.

   Stakeholders will be offered the opportunity to undertake an initial analysis of gaps in knowledge and understanding, and strengths and weaknesses of existing approaches and solutions for each priority issue. This should relate to the changing climate, increasing resource constraints, and the regulations agenda. It should use data and other information for a full understanding of the current situation and future challenge.

3. A small Working Party should be tasked to assess the initial analyses of gaps in knowledge and understanding and consider which stakeholders are best qualified to undertake a more thorough review of each issue. Members of the Working Party should come from organisations not involved in the bidding process to produce Action Plans.

4. Action plan

   For each priority issues, selected expert stakeholders will undertake a review of literature, current best practice and technology (including that outwith the golf sector) and produce an Action Plan. The Action Plan will provide a clear pathway for the industry to meet the challenges and take the opportunities presented by each priority issue. The final report needs to be clear on the following for each of the three scenarios:

   - What are challenges/opportunities for achieving playing optimal course condition and playability similar to that we enjoy today?
   - What are the solutions to address the challenges/opportunities?
   - What will be required from all key stakeholders to implement the Action Plan (e.g. greenkeepers, club managers, club owners, individual golfers, equipment and product suppliers, and also legislators)?

The report will:

- Consider the need for technological and behavioural change required for course management to cope with each prioritised challenge and scenarios
- Evaluate what can and should be done in terms of industry action across key action areas such as research, education, club support, knowledge sharing, monitoring and reporting of progress, external relations, consumer awareness, etc.

Each Action Plan should be delivered by a Lead organisation or individual, though other industry stakeholders can contribute their expertise to the production of an Action Plan by playing a Support role.

The Working Party to review delivered Action Plans and set goals and targets for implementation.

Action Plans to be circulated to the industry stakeholder group before being published.

5. Implementation

   Action Plans to be taken forward over an agreed time period (3 to 5 years is suggested), with regular (annual) review. Progress should be monitored using Key Performance Indicators.

6. Communicate and educate

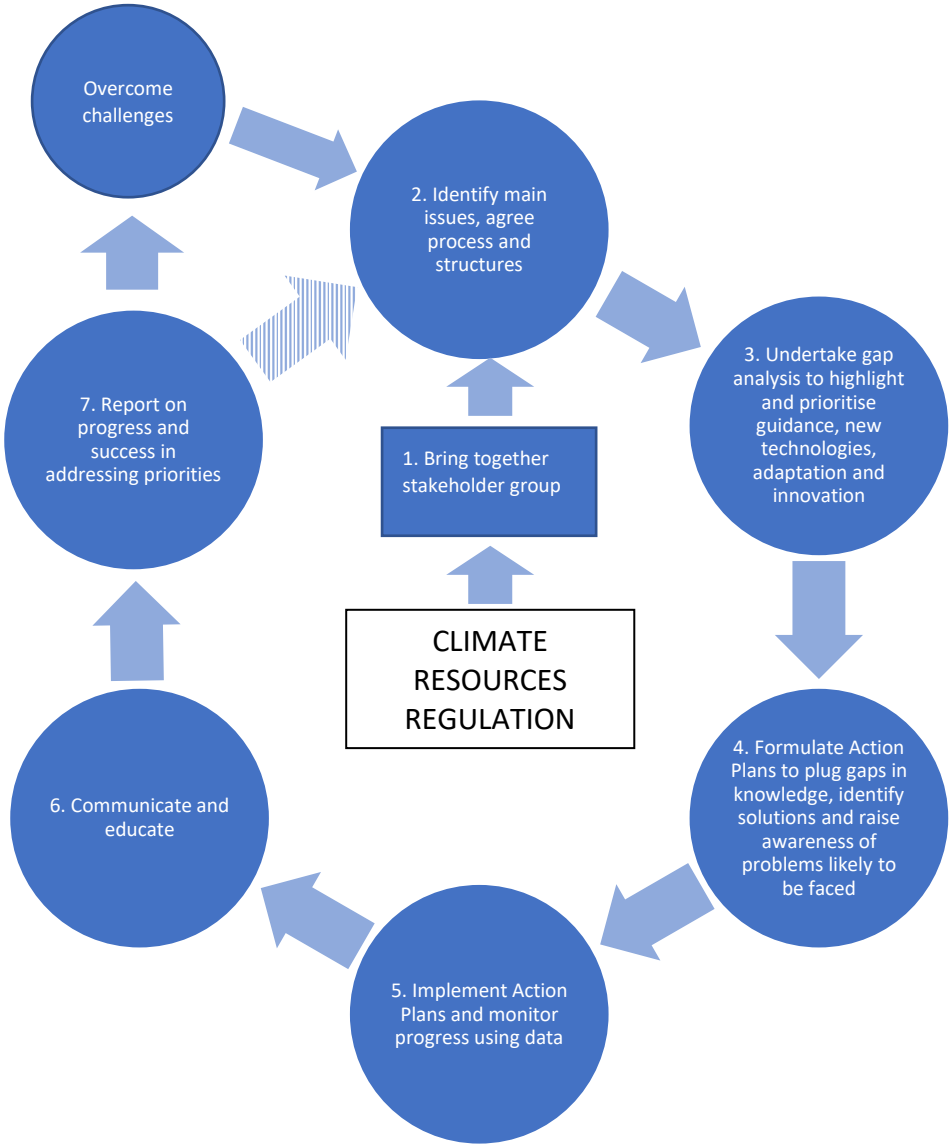
   Ensure that Core, Supporting and External stakeholders are aware of the implementation plan and monitoring process. Provide education and interim communications as and where necessary to achieve ongoing stakeholder buy-in.
7. Reporting

   Report on progress and level of success in addressing priority challenges. If the priority challenges have been addressed at the end of implementation, return to Step 2 in the Process.

Coming out of this process, the most likely actions to address challenges and opportunities and identify gaps in our knowledge for identified issues will be:

- General awareness raising
- Guidance on current knowledge and industry best practice
- Practitioner education
- Integration into club support and engagement programmes
- Greater knowledge sharing
- Monitoring and reporting of progress/trends in club practices and performance
- Research to plug gaps in knowledge
- Recognition and promotion of demonstration sites
- External relations – public and government

This process is represented in the following flow diagram:



Proposed Timeline for Golf Course 2030 GB&I

2018

March	Limited initial circulation of scene-setting document
April	Circulation to wider industry stakeholder group
April-June	Feedback received and assimilated into document
	Revised document, with process, sent out to stakeholder group for second round of consultation
August	Feedback received and document amended
September	Final draft of document circulated

2018 (cont)

September (cont)	Industry stakeholder meeting (final draft document review, agree priority issues and process for producing Action Plans)
	Stakeholders to be offered the opportunity to undertake an initial analysis of gaps in knowledge and understanding, and strengths and weaknesses of existing approaches and solutions
October-November	Working Party appointed and stakeholders awarded task of producing initial analyses
	Document finalised and circulated to stakeholder group
	Stakeholders undertake an initial analysis of gaps in knowledge and understanding, and strengths and weaknesses of existing approaches and solutions
December	Working Party consider initial analyses and appoint stakeholders to undertake more detailed review of literature, current best practice and technology
	Selected stakeholders begin work on Action Plans

2019

January-March	Selected stakeholders continue work on Action Plans
	Working Party develop a 'Call for Proposals' mechanism for projects coming out of Action Plans
April-May	Selected stakeholders deliver Action Plans
	Working Party review Action Plans
	Action Plans finalised, circulated to stakeholder group
June	Call for proposals to address Action Plan recommendations
August	Receipt of proposals
September	Working Party consider proposals and produce priority list of projects deserving support
September-October	Projects for this cycle time of Golf Course 2030 approved
	Projects commence

2020

January — Project progress report at stakeholder meeting

December — Decision made by Working Party if issue addressed satisfactorily. If not, then project continues. If it has been then next priority issue agreed and process begins from stakeholders being offered the opportunity to undertake an initial analysis of gaps in knowledge and understanding, and strengths and weaknesses of existing approaches and solutions (see September 2018)

2021

January — Projects progress report at stakeholder meeting

December — Decision made by Working Party if issue addressed satisfactorily. If not, then project continues. If it has been then next priority issue agreed and process begins from stakeholders being offered the opportunity to undertake an initial analysis of gaps in knowledge and understanding, and strengths and weaknesses of existing approaches and solutions (see September 2018)

2022

January — Final projects progress report at stakeholder meeting

December — Decision made by Working Party if issue addressed satisfactorily. If not, then a decision is made as to if the project should continue into the second time cycle of Golf Course 2030, if another project on the same issue should be adopted or if the process should move on to the next priority issue. If this latter position is agreed, the process begins from stakeholders being offered the opportunity to undertake an initial analysis of gaps in knowledge and understanding, and strengths and weaknesses of existing approaches and solutions (see September 2018)

ANALYSIS OF GAPS, STRENGTHS AND WEAKNESSES

For golf to prepare itself for the future, possibly the immediate future, there is a clear need for stakeholders to consider how the sport can address the challenges and opportunities to how we perceive and enjoy the sport today. For each region or country, an analysis of gaps in knowledge, and strengths and weaknesses of approach and solutions should be undertaken to identify what needs to happen in relation to the identified drivers of climate, resources and regulations, if we are to maintain playing surfaces in line with those we enjoy today. This process should include a review of the likely scenario(s) over the next 50 years, so that the gap analysis can list priorities for identifying solutions. The devised solutions should include the adoption of known best practice, technological innovation, greenkeeping adaptation, attitudinal approach by stakeholders, behaviour change, research, education, etc.

The strengths and weaknesses analysis can inform the structure of pathways for innovation, research, behaviour change and education, as well as ongoing development of club support programmes - together with stakeholder roles, responsibilities and accountability.

The initial stakeholder analysis of gaps in knowledge and understanding, and strengths and weaknesses of existing approaches and solutions for each agreed priority issue should answer these questions:

- What is the issue?
- Why am I/why is my organisation qualified to play the Lead role in developing the Action Plan for this issue?
- What will be the key components and structure of the Action Plan, e.g. awareness of the issue and existing best practice, the need for research and education, requirements for communication?
- What key deliverables is the Action Plan likely to propose?
- Which of the *Core, Supporting* and *External* stakeholders will you engage with during the production of the Action Plan?
- How will the success of the Action Plan delivery be measured?
- How long do you anticipate it taking to produce the Action Plan?

Using the following two tables will help undertake this analysis, relating responses to course condition and playability and the GC2030 scenarios.

Gaps in knowledge, understanding and technology

	Climate	Resources	Regulation
What we know			
What we don't know, but need to know			
Action to be taken			

Strengths and weaknesses of industry action

	Strengths	Weaknesses	Responses
Policies and commitments			
Knowledge sharing			
Connection between national strategy and implementation at facility level			
Club support and engagement			
Practitioner education programmes			
Monitoring and reporting			
Golfer awareness			

The Action Plan itself will include more detail in relation to the information provided above, with a review of literature, current best practice and technology supporting recommendations for action. The Action Plan will also include more detail in relation to, but not limited by, the following:

- Existing best practice – what is already known that can form part of the solution?
- Research – what are the key areas requiring investigation to fill gaps in knowledge?

- Education – what needs to be included in education provision?
- Political – is there a need for lobbying?
- Awareness raising/Communications – what should be communicated and who should it be communicated to?
- Are there other actions that need to be taken?
- What is the evidence base for recommendations?
- Funding – for recommended actions, what potential funding sources are available?

WORKING PARTY

For GC2030 Great Britain & Ireland, a Working Party has been formed which is comprised of a representative from The R&A, England Golf, Scottish Golf, the British & International Golf Greenkeepers Association (BIGGA), the Golf Course Superintendents Association of Ireland (GCSAI), the Golf Club Managers Association (GCMA), The Professional Golfers' Association (PGA) and the European Institute of Golf Course Architects (EIGCA).

The appointed members of the Golf Course 2030 Working Party will be expected to serve for the duration of a 3-year cycle of the initiative, after which there will be a review of the membership and remit.

The Working Party will be expected to undertake the following tasks:

- Review the initial analyses from stakeholders applying for the Lead role in the production of Action Plans
- Appoint stakeholders to take the Lead role in the production of Action Plans
- Review delivered Action Plans and set goals and targets for implementation
- Produce a 'Call for proposals' mechanism
- Consider proposals and produce a priority list of projects deserving support
- Decide if issues have been addressed satisfactorily.
  The R&A will provide administration support to the Working Party.

PRIORITY ISSUES

At a gathering of industry stakeholders in Manchester on 19 September 2018, five priorities for investigation over the first 3 year phase (2019-2022) for GC2030 GB&I were agreed and these are:

- Making GC2030 relevant and compelling to key audiences such as decision makers at golf facilities and how do we engage with golfers?

- Course condition and playability (measuring, benchmarking, setting standards, performance, consistency)

- Resources, focusing on:

  1. alternatives to synthetic chemical plant protection products
  2. labour (recruitment, retention, education, the changing nature of the golf course workplace)
  3. sand/aggregate availability

- Water as a limited resource (too little in dry summers) and coping with too much in wet winters

- Coastal change and its impact on golf courses.

ACTION PLANS

Action Plans for the 2019-2022 period will be published on The R&A website here.
The organisations taking the lead role in producing the Action Plans were:

- GEO Foundation – Communications: making GC2030 relevant
- Myerscough College - Course condition and playability
- SRUC Elmwood – Resources
- STRI Group – Water
- The R&A - Coastal change.

Each Action Plan defines the issue and the challenges and opportunities it presents. The Plans go on to propose actions to address the challenges and opportunities. These actions may include research (including information gathering) to fill gaps in our knowledge, production of existing best practice guidance, education needs, awareness raising and behaviour change, case studies and demonstration sites.

The Action Plans are available from The R&A at GolfCourse2030@RandA.org

PROJECTS

There will be a call for proposals from time to time to encourage project applications against the recommended actions in the Action Plans. The industry stakeholder group and other organisations known to The R&A capable of submitting a proposals will be contacted direct, and the calls will also be posted on the Golf Course 2030 section of The R&A website.

Information on Golf Course 2030 projects is available from The R&A website here and from The R&A at GolfCourse2030@RandA.org

Golf Course 2030 is an R&A led initiative looking to mitigate the impact of climate change, resource constraints and regulation on golf course condition and playability. This objective will be achieved by finding practical, workable solutions to address these serious challenges through a programme of research, education and communications.

Golf Course 2030.

R&A

www.randa.org/en/sustainability/golfcourse2030