



# **Golf Course 2030 Switzerland**

## **Playability and ecology in harmony**

Epalinges, 4th November 2020

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# Golf Course 2030 Switzerland



**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.**

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## Impressum

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## Executive Summary

The R&A started the initiative Golf Course 2030 'Playability and Ecology in Harmony' in 2018 and challenges all federations to describe their GC 2030 strategy. All core stakeholders have commented on this document that has been pre-pared by the Committee 'Sustainability & Golf Courses' of Swiss Golf and has been approved by the Board of Swiss Golf.

The strategy document from Swiss Golf, presented here, reflects **one of the 6 key strategic targets of Swiss Golf** to demonstrate and execute on the three pillars of **sustainability**: Economic, Ecologic and Social Impact. In general, Swiss Golf endeavours to better understand what can be done to improve sustainability within golf and the larger community, demonstrate transparently what golf can achieve and increase the awareness among golfers with regard to these sustainability issues, including what they can do through improved behaviour on and around the golf course. The values of Swiss Golf are our guiding compass.

Climate change, resource constraints and the regulations agenda are the three main drivers impacting our ability to secure optimal golf course condition and playability for current and future generations. This document describes the pro-cess for developing a roadmap which will address these three main drivers, based on fundamental guiding principles for developing resilient and sustainable golf courses. These principles include such issues such as:

1. Document and Operate according to Consistent Policies
2. Continuous education for all stakeholders
3. Focus on- and prepare for resource scarcity, improve the habitat and biodiversity, leading up to a regenerative golf design
4. Benchmarking and Best Practice Sharing for continuous improvement
5. Implementation of Key Metrics to measure our achievements

The ultimate objective of the document is to identify the priority issues within the swiss golf industry and develop action plans to address these issues. Working groups and competence groups will be put together to develop these action plans to address the following 5 priority issues found in chapter 6:

1. Making GC 2030 Switzerland relevant and compelling to key audiences.
2. Course condition and playability
3. Resource efficiency
4. Improved communication
5. Lobbying for golf



The process as described in chapter 5.2 will follow the RADAR Logic (**R**equired Results; **A**pproach; **D**eploy; **A**ssess & **R**efine) and the timeline as indicated in chapter 8 has been developed to motivate individuals and associations and initiate not only a better image of golf, but above all demonstrate that the golf industry takes appropriate action for which we are accountable.

The combined and shared knowledge and experience with all supporting partners will bring golf a leap forward in leading sustainability efforts.

**Our responsibility and accountability are not what we are forced to accomplish, but what we want to accomplish!**

Swiss Golf 'Committee Sustainability & Golf Courses'

## Introduction to Golf Course 2030 Switzerland 1

### Golf meeting future challenges 1

The world is presently confronted with many challenges, climate change, loss of biodiversity, limited natural resources, chemical use, soil protection, waste management, energy efficiency, health issues and the changes that the digital revolution brings to our society and economy, etc. At a global level we are trying to find solutions to these challenges and Agenda 2030 developed by the United Nations is one of the leaders in this respect.



**Figure No. 1:** Sustainable Developments Goals (Source: Agenda 2030, UNO - Ende September 2015 haben die UNO-Mitgliedstaaten 17 nachhaltige Entwicklungsziele (SDGs) verabschiedet, die unseren Planeten bis 2030 lebenswerter machen sollen).

Golf Course 2030 was initiated by The R&A in 2018 as a response to this UN Agenda 2030 with the goal of addressing important sustainability issues that specifically touch the golf industry across the globe, most importantly:

#### **in general:**

- climate change
- biodiversity
- environmental impact of golf development
- health promotion

#### **for resources:**

- water
- use of chemicals
- availability and use of land

The R&A governs the sport of golf worldwide, outside of the USA and Mexico, on behalf of over 36 million golfers in 143 countries and with the consent of 157 affiliated organizations from amateur and professional golf. The R&A is committed to investing in developing golf and supports the growth of the sport internationally, including the development and management of sustainable golf facilities.

The R&A continues to lead the Golf Course 2030 initiative, supporting stakeholders to develop the initiative in their own country or region and investing in research, education and other activities to prepare the sport for what may be challenging times ahead.

As defined by The R&A, 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. This document has been put together as a national response from Switzerland to The R&A's lead in the Golf Course 2030 initiative. In this vein, the Golf Course 2030 initiative (or roadmap) for Switzerland will address these issues in a context that makes sense for the environmental priorities found more specifically within Switzerland.



**Figure No. 2:** Kingfisher (*Alcedo atthis*) on the Golfpark Otelfingen (Quelle: Isabelle Joss).

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. As such, the plan for Switzerland will address all three pillars of



sustainability: society, economy and environment, looking for principles to maintain golf facilities in the most responsible manner possible.

Golf Course 2030, referred to from here on as **Golf Course 2030 Switzerland**, seeks to bring the Swiss golf industry together to clearly identify the challenges and opportunities facing those developing, designing, building and most specifically managing and maintaining golf courses with regards to the changing climate, increasing resource constraints, and the regulations agenda.

As initially stated by The R&A, there are a number of imaginable future scenarios for golf, ranging from "business as usual" to a "doomsday prediction of disruption from extreme weather, water scarcity, high resource costs and limited chemical availability". It is obviously impossible to predict the exact scenario for our future and the outlook is changing on a daily basis, however present predictions would indicate that these pressures will increase, and the golf industry needs to be prepared to make considerable change in attitudes and behaviors in the coming decades.

In addition to the production of the roadmap, **Golf Course 2030 Switzerland** 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 Switzerland** 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 Switzerland
- 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.
- Actively inform and educate golfers as to the necessity of change in playing conditions (e.g. slower green speed).



In this way, **Golf Course 2030 Switzerland** 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
- recognize credible leadership activity in course management.

### **What is optimal course condition and playability ? 2**

The objective of Golf Course 2030 Switzerland states that it is to “secure 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]

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, such as seasonal weather and/or financial capacity.

### **Role of Swiss Golf 3**

Like The R&A, Swiss Golf has developed a list of important environmental protection issues including:

- Climate change
- Preserving natural resources
- Preservation and creation of ecology and biodiversity
- Nature and landscapenprotection
- Soil protection
- Protection of heritage and archeological sites
- Waste management and recycling
- Efficient management of energy and water consumption



As a response to these environmental issues, Swiss Golf has put together a Sustainability Committee who is now leading the movement to openly discuss the challenges and opportunities and encourage golf facilities to choose the best practices for managing and maintaining their golf courses in consideration of the changing climate, increasing resources constraints and changing regulations. As their mission statement says, **"Swiss Golf supports its members in the sustainable use of resources, in promoting biodiversity, in a responsible development of the natural environment and in developing this health promotion game for young and old"**.

The committee includes the following members:

- Jan Driessens, President
- Michel Follonier, Swiss Golf Director Services
- Rolf Bernhard, Swiss Green Sportstättenunterhalt AG
- Franziska Iten, Head Greenkeeper GC Entfelden
- Erich Steiner, Steiner & Partner Landschaftsarchitektur GmbH
- Jonathan Swan, Sustainability Swiss Golf

This Swiss Golf committee will take the lead role of bringing different stakeholders together and oversee communication within and outside the golf community. Swiss Golf is also in discussions with PUSCH and IP Suisse with the goal of working together to help guide golf into the future. Swiss Golf also intend to engage with the Federal Office for the Environment (FOEN) to develop a new set of guidelines for golf which will replace the document that came out in 1998.

## Golf Course 2030 Switzerland Stakeholders 2

The industry stakeholders who will work towards these goals can be divided into core and supporting groups:

- **Core Stakeholders** could be:
  - National Governing bodies
  - Club Manager Association
  - Greenkeeper Association
  - Professional Golfer Association
  - Course Owners
  - Golf Course Architects
  - The R&A
  - Professional Tour Organisations
  
- **Supporting Stakeholders:**
  - GEO Foundation
  - Dedicated "Golf and Sustainability" Partners
  - Agronomists and other relevant Consultants
  - Researchers
  - Golf Developers or Builders
  - Educators
  - Commercial Suppliers
  - Golfers (amateur and professional)
  - Golf Media



**Figure No. 3:** Newly created habitat for amphibians on the Pilatus Course, Golfpark Holzhäusern (Quelle: Erich Steiner).



The **Industry Stakeholders** to be engaged in the Golf Course 2030 process within Switzerland are:

- Swiss Golf
- Migros GolfCard
- Association Suisse des Golfeurs Indépendants (ASGI)
- Swiss Greenkeepers Association (SGA-D and SGA-F)
- Association Swiss Golf Managers (ASGM)
- Swiss Professional Golfers Association (Swiss PGA)
- European Institute of Golf Course Architects (Steiner & Partner GmbH representing EIGCA within Switzerland)

Together with **Supporting Partners**:

- WWF Switzerland
- IP-SUISSE
- Vogelwarte Sempach
- Pro Natura
- Koordinationsstelle für Amphibien- & Reptilienschutz in der Schweiz (KARCH)
- Praktischer Umweltschutz (PUSCH)
- Swiss Recycling (Kreislaufwirtschaft Schweiz)
- Suppliers (Local and International; Construction, Equipment and Resources)
- Professional and notable amateur golfers (Ambassadors of Golf)
- Swiss golf tour companies
- Omega European Masters
- VP Bank Swiss Ladies Open

The initiative will engage with other **External Supporting Stakeholders** who have influence on golf, including:

- National, Cantonal and Communal Government
- Bundesamt für Umwelt (BAFU)
- Staatssekretariat für Wirtschaft (SECO)
- Bundesamt für Sport (BASPO)
- Bundesamt für Gesundheit (BAG)
- Schweiz Tourismus
- Swiss Olympic
- Universities and Research Institutions
- Jardin Suisse
- Umtec Technologie AG: SEBI Program (Specific Eco Benefit Indicator)
- any other NGOs, the general public and non-golf media

Although not **partners**, there should be **regular communication** with:

- UN Climate
- European Golf Association (EGA)
- International Golf Federation (IGF)
- Federation of European Greenkeepers Association (FEGGA)
- Other national Golf Federations

## Drivers for Adaptation 3

There are three main external 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 Switzerland must assess how the external influences, impacts of climate change, availability of resources and increasing depth of regulation will affect day-to-day operations at the golf facility.

### Climate 1

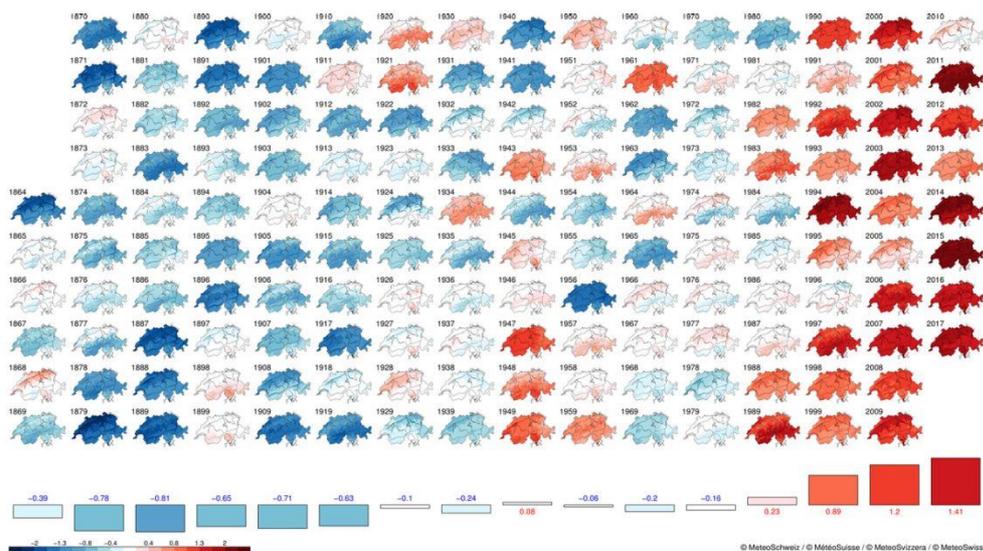


Abbildung 2: Temperaturabweichungen vom Mittel 1961-1990 in der Schweiz für jedes Jahr seit 1864. Jahre unter dem Mittel sind in blau, Jahre über dem Mittel rot dargestellt. Im unteren Teil der Grafik sind die Abweichungen der Jahrzehnte als eingefärbte Säulen dargestellt.

**Figure No. 4:** Temperature Variation over time: 1864-2017 (Source: Bundesamt für Meteorologie und Klimatologie MeteoSchweiz).

Climate change including a tendency towards higher average annual temperatures and extreme events will cause problems for course managers. Turf does best in an environment with limited variability. Changes in weather patterns will result in the need for course management to adjust to such circumstances. Climate predictions for Switzerland suggest that there will be changes to our weather patterns such as:

- Hotter, drier summers with a tendency towards longer periods of drought. Although as the watershed of Europe, Switzerland generally doesn't have major water availability issues compared to many surrounding countries, there were still periods over the last 20 years where available fresh water has been a concern. In such instances when water sources become scarce, it is essential to keep potable water for human and animal consumption and when necessary irrigation of agricultural crops. Golf must therefore find alternative sources and storage solutions if they wish to irrigate playing surfaces.
- There is also a tendency towards short duration extreme rainfall events including occasional massive flooding events which can lead to potentially major property damage. This includes a potential risk for golf courses with an increase in drainage issues and even the potential for major destruction of golf course surfaces, surrounding areas and infrastructure.
- Additionally, a reduction in permafrost in the alpine region is resulting in an increased instability of rock and soil. This poses the potential risk of significant land movement and additional course damage.

## **Ressources 2**

The resources considered essential for today's golf course are likely to become scarcer and cost more. This applies to water, pesticides, fertilizers, sand, energy, labour, etc. Resource use on the golf course varies dependent on the type of course, e.g. links, parkland, heathland etc. and on the intensity of management related to the area of the course being treated. In Switzerland we do not necessarily refer to such clearly defined golf course "types" as heathland, linksland or down-land as found, for example, in Scotland, however we have a number of different regions with different micro-climates and a variety of soils and we can definitely distinguish between different courses having different characteristics. The main regions of the Jura, the central plateau, the Alps and the southern region of Ticino each have a combination of climate factors such as altitude, temperature, rainfall, wind together with varying soils which can make a significant difference to the input of resources.



**Figure No. 5:** A typical fairway (Source: Steiner & Partner Landschaftsarchitektur GmbH).

A golf hole (see Figure No. 3) is made up of a number of different areas, which tend to receive different levels of treatment. The greens 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 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 and green approach/surround 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 are a sand-filled hazard, whose number can vary on any individual golf hole. The maintained rough receives very limited management, mainly mowing. Up to 50% of the area of a golf course can be potentially deemed as natural habitat, providing a haven for wildlife.

The golf facility itself can also be considered as a resource in how it contributes towards issues such as community (multi-functionality), compensation area, health/well-being, and biodiversity in combination with agriculture and forest areas, which is in Switzerland defined by the BAFU in terms of the ecologic infrastructure.

The resources whose limited availability or quality might impact on golf course condition and playability in the future would include:

- water
- availability of plant protection products
- quality sand for surfaces or bunkers
- fuels for turf maintenance machines
- trained greenkeepers and environmental specialists

### Regulations 3

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 fertilizers, energy and waste will also influence the future management of our golf courses. As with the other drivers, the impact of regulation will likely vary somewhat depending on the type and location of the course, e.g. links or parkland, and on the intensity of management related to the different parts of the course.

Legislation in Switzerland 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 Switzerland likely to impact on golf course condition and playability are:

#### Federal Laws 1

- Loi fédérale sur l'aménagement du territoire (Loi sur l'aménagement du territoire, LAT du 22 juin 1979; Etat le 1er janvier 2019)
- Bundesgesetz über die Raumplanung (Raumplanungsgesetz, RPG vom 22. Juni 1979; Stand am 1. Januar 2019)
- Loi fédérale sur la protection de l'environnement (Loi sur la protection de l'environnement, LPE du 7 octobre 1983; Etat le 1er juillet 2020)
- Bundesgesetz über den Umweltschutz (Umweltschutzgesetz, USG vom 7. Oktober 1983; Stand am 1. Juli 2020)
  
- Loi fédérale sur la protection de la nature et du paysage, LPN du 1er juillet 1966; Etat le 1er avril 2020
- Bundesgesetz über den Natur- und Heimatschutz, NHG vom 1. Juli 1966; Stand am 1. April 2020
  
- Ordonnance sur l'aménagement du territoire, OAT du 28 juin 2000; Etat le 1er juin 2020
- Raumplanungsverordnung, RPV vom 28. Juni 2000; Stand am 1. Juni 2020
  
- Ordonnance relative à l'étude de l'impact sur l'environnement, OEIE du 19 octobre 1988; Etat le 1er octobre 2016
- Verordnung über die Umweltverträglichkeitsprüfung, UVPV vom 19. Oktober 1988; Stand am 1. Oktober 2016

#### Golf Specific Guidelines (OFEV/BAFU) 2

- Golf: Aménagement du Territoire – Paysage - Environnement 1998
- Golf: Raumplanung – Landschaft – Umwelt 1998

*(There is currently a work group in place to try to up-grade or re-work the existing guidelines in order to include the most recent decisions by Swiss Golf and in-line with GEO criteria/guidelines.)*

### Water Protection 3

- Loi fédérale sur la protection des eaux, LEaux du 24 janvier 1991; Etat le 1er janvier 2020
- Bundesgesetz über den Schutz der Gewässer (Gewässerschutzgesetz, GSchG vom 24. Januar 1991; Stand am 1. Januar 2020)
- Ordonnance sur la protection des eaux, OEaux du 28 octobre 1998; Etat le 1er avril 2020
- Gewässerschutzverordnung, GSchV vom 28. Oktober 1998; Stand am 1. April 2020
- Wegleitung Grundwasserschutz, 2004, BAFU (Stand 14. August 2012)
- Instructions pratiques pour la protection des eaux souterraines 2004, BAFU, Etat le 14 août 2012
- VSA-Richtlinie Abwasserbewirtschaftung bei Regenwetter (2019)
- Schweizer Norm (SN 592 000) Planung und Erstellung von Anlagen für die Liegenschaftsentwässerung (VSA, 2002)

### Soil Protection 4

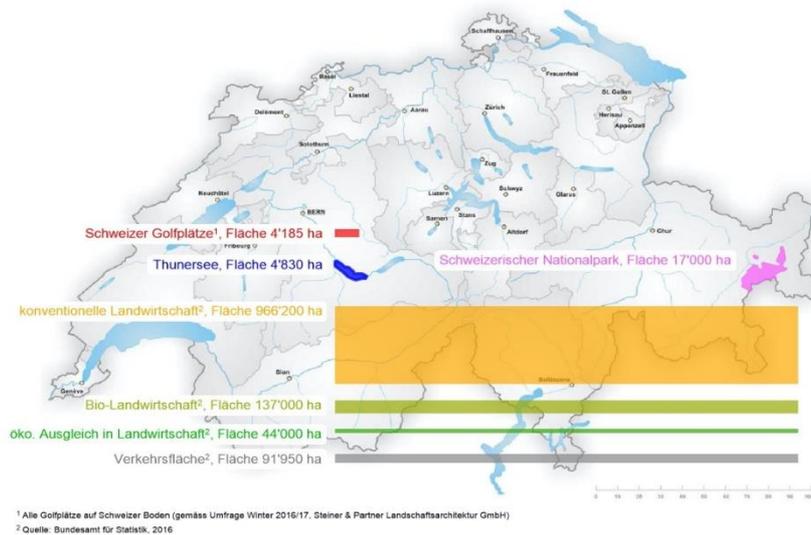
- Protection des sols lors de la construction de terrains de golf – Un aid-mémoire à l'intention des maîtres d'ouvrages, des auteurs de projets, des chefs de chantiers, des entrepreneurs, des autorités, des propriétaires fonciers, des exploitants et des responsables de la protection des sols. (OFEV)
- Bodenschutz beim Bau von Golfanlagen – Ein Merkblatt für Bauherren, Projektverfasser, Bauleiter, Bauunternehmer, Behörden, Landeigentümer, Bodenbewirtschaftler und Bodenschutzbeauftragte. (BAFU)
- Ordonnance sur les atteintes portées aux sols, OSol du 1er juillet 1998; Etat le 12 avril 2016
- Verordnung über Belastungen des Bodens, VBBo vom 1. Juli 1998; Stand am 12. April 2016

### Chemical Use 5

- Ordonnance sur la mise en circulation des produits phytosanitaires (Ordonnance sur les produits phytosanitaires, OPPh du 12 mai 2010; Etat le 1er juillet 2020)
- Verordnung über das Inverkehrbringen von Pflanzenschutzmitteln (Pflanzenschutzmittelverordnung, PSMV vom 12. Mai 2010; Stand am 1. Juli 2020)
- Ordonnance sur la réduction des risques liés à l'utilisation de substances, de préparations et d'objets particulièrement dangereux (Ordonnance sur la réduction des risques liés aux produits chimiques, ORRChim du 18 mai 2005; Etat le 23 juin 2020)
- Verordnung zur Reduktion von Risiken beim Umgang mit bestimmten besonders gefährlichen Stoffen, Zubereitungen und Gegenständen (Chemikalien-Risikoreduktions-Verordnung, ChemRRV vom 18. Mai 2005; Stand am 23. Juni 2020)

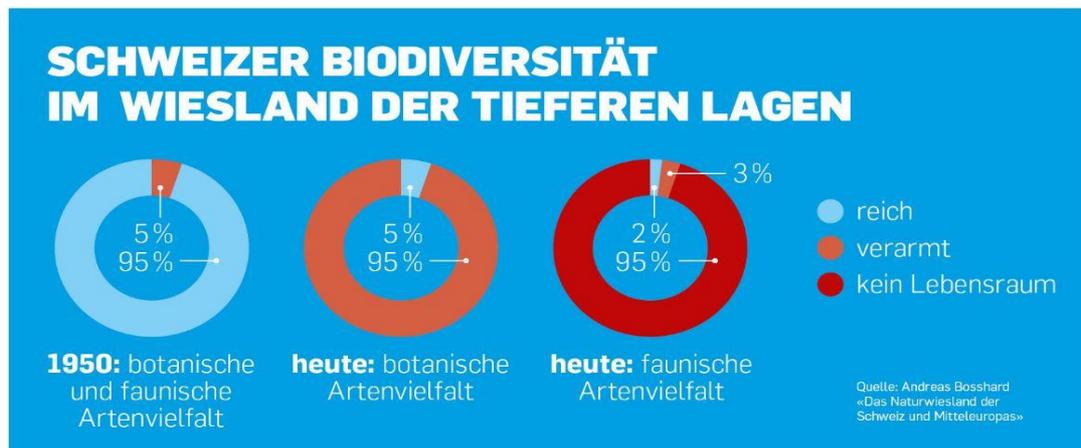
## Land use for Golf 6

In terms of land use, golf courses are included in the surfaces zoned as sports and recreation. The land use of Golf is under 0,4% of the land use for agriculture!



**Figure No. 6:** Flächenvergleich Golfnutzung und andere Nutzungsarten 2016/17 (Source: Steiner & Partner GmbH, Thun).

## Biodiversity 7



**Figure No. 7:** Changing biodiversity in Switzerland (Source: Andreas Bosshard).

- Ordonnance sur l'utilisation d'organismes dans l'environnement (Ordonnance sur la dissémination dans l'environnement, ODE du 10 septembre 2008; Etat le 1er janvier 2020)
- Verordnung über den Umgang mit Organismen in der Umwelt (Freisetzungsverordnung, FrSV vom 10. September 2008; Stand am 1. Januar 2020)

## Future Scenarios 4

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 adaptation pose many potential scenarios. Presented here are the three 2030 scenarios put forth by The R&A, 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 behavioral 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 realized. 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 behavioral 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.



**Figure No. 8:** Extreme heavy precipitation events led to massive flooding and destroyed parts of the golf course in Engelberg in summer 2017. (Source: Steiner & Partner GmbH, Thun).

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 positively on the contribution of golf to the local, regional and national economy.

### **Scenario 3**

The banning of all chemical plant protection products and fertilizers, together with 75% less water being available for irrigation compared with current levels. Alternative technologies, management solutions and behavioral 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.

Although it is difficult to predict the future, the trends would seem to indicate that our future scenario would likely be somewhere between scenario 2 and 3, with some considerable challenges ahead and the need to adapt practices to produce a similar level of course condition.

## Practical Action 5

### Guiding Principles for resilient and sustainable golf courses 1

The main objective of Golf Course 2030 Switzerland is establishing an industry 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. There are, however, a number of fundamental, universal practical principles for golf course development, maintenance 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.

1. We plan over the longer-term and operate under consistent policies, which are documented.
2. We prepare for future challenges. Consider the predicted impact of the changing climate (such as flooding or drought), the availability and costs of vital resources and the constraints placed by regulation.
3. We recognize the professionalism of well qualified course managers and their staff. Continuous education for the challenges ahead will be planned. The staff will play a vital role in securing optimal course condition and playability.
4. We 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 will support their greenkeepers in adhering to this policy.
5. We 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. We foresee that water scarcity and cost for water are 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. We know that there will be 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. We reduce fertilizer since it 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. We avoid excessive use of organic matter that provides for an accumulation of 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. We recommend that mowing heights should be implemented to sustain grasses which are fit for purpose, but which are inherently healthy. 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, fertilizer and pesticide inputs to correct.
11. We expect additional CO2 legislation that 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, utilizing grasses which are fit for purpose, but which require the least input of maintenance resource.
12. We focus on course design, construction and maintenance to prevent waste and maximizing reuse and recycling. In short promoting the concepts of a circular economy (Re-duce - Re-use - Re-cycle), permaculture golf courses and a regenerative golf design.
13. We anticipate that 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. We seek cooperation with forest and agriculture area protection to improve on biodiversity.
14. We encourage that Golf has a responsibility to wider society. The design, construction and maintenance of facilities will focus on making a positive contribution to local communities, such as by providing a multi-functional venue for wider community integration and recreation.
15. We assess objectively the condition of playing surfaces, particularly the putting surfaces, on the golf course 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. We will implement the recording of key resource metrics for course management, e.g. water, chemicals, energy, waste and biodiversity. We require sustainability reporting on course operations on a facility and country level. We recognize the necessity to monitor the impact of the challenges facing greenkeepers, the implementation of research



outcomes, adaptations in management and compliance with regulations. Continuous improvement and sharing best practices through benchmarking will be documented.

17. We will actively educate Golfers as to the necessity of change and winover acceptance of changes in playing conditions. To this end we will work together with those responsible for the organization of PGA events and encourage Professionals and top amateur Golfers to act as role models.

## **Process 2**

As stated previously, the main objective of Golf Course 2030 Switzerland is to help stakeholders develop a roadmap and specific action plans that will help those developing, designing, building, maintaining and managing golf courses to address the challenges and opportunities from the external influences changing climate, increasing resource constraints, and the regulations agenda facing the industry over the coming decade.

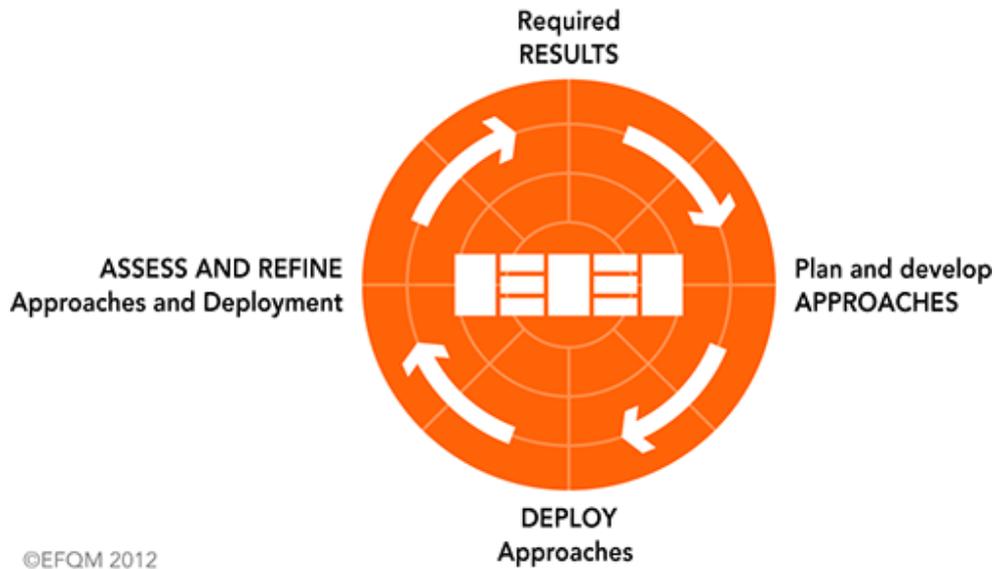
There are a number of necessary steps in the roadmap towards the production of action plans which will be a collaborative effort from the industry in Switzerland. The following process will be undertaken in the development of a Golf Course 2030 Switzerland roadmap and resulting Action Plans:

First of all, Swiss Golf will establish a Golf Course 2030 core stakeholder group which will be responsible for further analysis of- and developing a SWOT and TOWS analysis to set up an initial list of priority issues (see first framework of SWOT & TOWS here below under point 8). This group will then appoint several specific working and/or competence groups who will be responsible for researching these priority issues with the ultimate goal of producing action plans to address these issues.

These working and/or competence groups will be balanced with a strategic and technical representation of people focused on the long-term interests in the future of the sport to be addressed over the next 3-5 years.

1. The working groups will concentrate on the changing climate, increasing resource constraints and the regulations agenda. They will use data and other information for a full understanding of the current situation and future challenge.
2. Selected expert stakeholders within each working and/or competence group will undertake a review of literature, current best practice and technology for their priority issues (including that which is available outside the golf sector). Following this research, action plans will be produced which outline activities to meet the challenges and take the opportunities presented by each priority issue. The final report will be clear on the following for each of the three scenarios mentioned above:
  - a. What are the challenges/opportunities for achieving playing optimal course condition and playability similar to that we enjoy today?
  - b. What are the solutions to address the challenges/opportunities?
  - c. 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, legislators)?
  - d. Consideration given for technological and behavioral change required for course management to cope with each prioritized challenge and scenario

- e. 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.
3. The Golf Course 2030 core stakeholder group will review delivered Action Plans and set goals and targets for implementation (Required Results). Action Plans will be circulated to all the industry working groups before being published. Action plans and outcomes will be delivered in close coordination with GEO Foundation to ensure the optimum alignment between research and new knowledge and tools, with the sustainability programs for golf GEO provides; Namely:
    - a. Voluntary Sustainability Standards (VSS)
    - b. OnCourse sustainability program for club and course management
    - c. Sustainability Performance Indicators integrated into OnCourse database
    - d. Processes and protocols for verification in Switzerland
    - e. Certification awards in Switzerland
    - f. Frameworks and models for sustainability analysis and reporting for clubs, country and tournaments
  4. Progress and Approach will be monitored using Key Performance Indicators (Assess & Refine). The GEO OnCourse© Switzerland program will help us in determining and Deploying the Approach for the KPIs (combining 'best practices' and data indicators) and will act as a common reference for continuous learning amongst all golf courses in Switzerland. This also involves the broader international prospects of collaboration with other National Federations (like with NGF in The Netherlands) and with knowledge and expert advisors like STRI (Sports Turf Research Institute), TROON Agronomist and STERF in Scandinavia. A good collaboration with WWF and other competent NGO's will only broaden our vision on how to Approach solutions and create a sustainable golf environment.
  5. Communication and education: We will ensure, that all stakeholders are aware of the implementation plan and monitoring process. Ongoing stakeholder and consumer buy-in is key in this process.
  6. Reporting on action plans and level of success in addressing priority challenges will be key. The process will follow the industry standard as schematically indicated by EFQM with the RADAR logic:



**Figure No. 9:** EFQM RADAR logic (Source: EFQM).

7. The RADAR logic is a dynamic assessment framework and powerful management tool that provides a structured approach to questioning the performance of an organization.

At the highest level, RADAR logic states that an organization needs to:

- a. Determine the Results it is aiming to achieve as part of its strategy.
  - b. Plan and develop an integrated set of sound Approaches to deliver the required results both now and in the future.
  - c. Deploy the approaches in a systematic way to ensure implementation.
  - d. Assess and refine the deployed approaches based on monitoring and analysis of the results achieved and ongoing learning activities.
8. The proposed timeline for Golf course 2030 Switzerland Graph, timeline for next 3-5 years.
  9. SWOT and TOWS Analysis, based on current knowledge and experience, that need further development by the Working and/or Competence Groups.



**Table No. 1:** SWOT-Analysis.

Golf / Swiss External Market and Circumstances		<b>Internal Analysis</b> The internal evaluation of Swiss Golf Sustainability & Golf Courses	
		<b>Strengths</b>	<b>Weaknesses</b>
<b>External Analysis</b> The external environment influencing Swiss Golf	<b>Opportunities</b>	<ul style="list-style-type: none"> <li>- habitat creation</li> <li>- biodiversity in combination with agriculture and forest (interactivity in infrastructure)</li> <li>- CO<sub>2</sub>-Sequestration (turf, grass and trees)</li> <li>- compensation area for community and industry</li> <li>- sustainable drainage</li> <li>- water filtration/cleaning</li> <li>- erosion control</li> <li>- qualified greenkeeping staff</li> <li>- low turn-over in staff</li> <li>- noise is low, quiet (good for biodiversity)</li> </ul>	<ul style="list-style-type: none"> <li>- elite image</li> <li>- communication</li> <li>- golfer behaviour</li> <li>- understanding of sustainability by golfers, management and greenkeeping</li> <li>- use of resources</li> <li>- no closed loop systems</li> <li>- water management (unsustainable)</li> <li>- little or no participation?</li> <li>- not fully exploiting ecosystem services</li> <li>- lacking systematic thinking and understanding of interactions (social-golf-eco)</li> </ul>
	<b>Threats</b>	<ul style="list-style-type: none"> <li>- playability maintained through greenkeeping knowledge (turf varieties and cultural practices)</li> <li>- investment in self-sufficiency (i.e. water and energy)</li> <li>- investment in technology (Industry 4.0):               <ul style="list-style-type: none"> <li>. computer controlled irrigation (efficiency)</li> <li>. GolfGIS (precise digital plans for management of turf and natural areas)</li> <li>. turf health monitoring (remote sensing)</li> </ul> </li> <li>- continuous learning and education</li> </ul>	<ul style="list-style-type: none"> <li>- elite image (deficit)</li> <li>- aging population</li> <li>- traffic</li> <li>- takes too much time</li> <li>- legislation/regulations on land, water and chemical use</li> <li>- future availability of land, water and chemicals</li> <li>- need for investment to keep up with these pressures</li> </ul>

**Table No. 2:** TOWS-Analysis.

<div style="text-align: right;">External Factors</div> <div style="text-align: left;">Internal Factors</div>	<p style="text-align: center;"><b>Opportunities</b> (external, positive)</p>	<p style="text-align: center;"><b>Threats</b> (external, negative)</p>
<p style="text-align: center;"><b>Strengths</b> (internal, positive)</p>	<p><b>Attack</b> (Strength-Opportunity strategies):</p> <ul style="list-style-type: none"> <li>- regenerative golf course design and renovation</li> <li>- circular economy</li> <li>- species management-research &amp; development</li> <li>- stakeholder management</li> <li>- clear strategic vision (3/5/10 years)</li> <li>- communication</li> <li>- digital transition</li> <li>- continuous development &amp; education of personnel</li> <li>- CO<sub>2</sub> negative (SEBI Study)</li> <li>- network with NGO, agriculture, BAFU etc.</li> </ul>	<p><b>Defend</b> (Strengths-Threats strategies)</p> <ul style="list-style-type: none"> <li>- communication</li> <li>- establishing alternatives for 'forbidden' products</li> <li>- lobby the political arena at all levels</li> <li>- transparency</li> <li>- metrics of achievements/KPI's</li> </ul>
<p style="text-align: center;"><b>Weaknesses</b> (internal, negative)</p>	<p><b>Clean Up</b> (Weakness-Opportunity strategies):</p> <ul style="list-style-type: none"> <li>- communication (Image)</li> <li>- create better communication with authorities</li> <li>- education of golfers, management and greenkeeping</li> <li>- open days</li> <li>- avoid waste &amp; costs</li> <li>- investments for less use of resources</li> </ul>	<p><b>Chaos</b> (Weakness-Threats strategies):</p> <ul style="list-style-type: none"> <li>- change elitist image of golf sport</li> <li>- demonstrate social- and environmental responsibility, use less resources</li> <li>- communication</li> <li>- investments in self-sufficiency</li> </ul>



## Priority Issues 6

The Sustainability Committee of Swiss Golf has determined the following 5 priorities based on the strategic intent as formulated by the Board of Swiss Golf: Swiss Golf as main stakeholder wants to position golf in an **ecologically optimised, economically healthy** and **socially integrated** way and communicate the concept of sustainability to all golfers.

1. Making **Golf Course 2030 Switzerland** relevant and compelling to key audiences such as decision makers at golf facilities and how do we engage with golfers?
  - a. Implementation of GEO OnCourse© Switzerland program and GEO Certified® labeling system throughout Swiss Golf by 2027
  - b. Handprint and Footprint calculations with selected sampled golf courses according to SEBI principles
  - c. CO<sub>2</sub> Neutral Eco-Balance by 2035, investigate if negative CO<sub>2</sub> footprint is achievable, including further testing and development of GEO Carbon Balance calculator for facilities (emissions and sequestration)
2. Course condition and playability (measuring, benchmarking, setting standards, performance, consistency, best practices)
  - a. Potential to further adapt GEO OnCourse© Switzerland content
  - b. Analysis of OnCourse database
  - c. STRI, STERF and TROON research findings
  - d. Equipment and performance standards
  - e. Course standards for PGA events
3. Resources, focusing on:
  - a. Alternatives to synthetic chemical plant protection products
  - b. Labour (recruitment, retention, education, the changing nature of the golf course workplace)
  - c. Water as a limited resource (too little in dry summers) and coping with too much in wet winters
  - d. Energy as a limited resource, evaluate sustainable alternatives to achieve the highest level of self-sufficiency
  - e. Checklist on Waste management and Circular Economy alternatives
  - f. Clean discharge of water in washing areas
  - g. Safe storage of hazardous materials, if any
4. Regular communication using the Swiss Golf Magazine, social media and monthly newsletters on key findings, results, examples and initiatives.
5. Intensified lobby at relevant political levels and NGO's, being transparent on achievements, challenges and opportunities, creating a work-in-progress framework that is consistent with and stable for all developments.



**In general**, Swiss Golf intends to

1. better understand step by step what can be done in the larger context of sustainable solutions in connection with golf and the broader community.
2. demonstrate transparently in the long run that the golf industry can achieve:
  - a. less use resources (water and energy)
  - b. less use pesticides and fertilizers (as little as possible, as much as necessary)
  - c. develop new turf species that are more resistant and need less treatment and less water
  - d. avoid food waste and buy locally
  - e. avoid packaging waste (including plastic bottles) and single use utensils
  - f. provide evidence of a healthier lifestyle for those people who play golf
  - g. tournament organization with a specific aim to be GEO Certified for each tournament.
  - h. Develop a comprehensive cooperation between the federal and cantonal governments to better preserve and plan resources and land use (i.e. L.K.S.)
  - i. Demonstrate how wildlife/insects (fauna) and trees/plants (flora) can benefit from GOLF

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.

## Action Plans and Communication 7

Action Plans for the 2021-2025 period will be published on Swiss Golf website. The following is a list of “possible” working and/or competence groups who could produce these actions plans:

- Jardin Suisse
- IP Suisse
- Universities (Technical, Social Science, Agriculture, other)
- Private Experts or Consultants
- Umtec Technologie AG - SEBI

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.

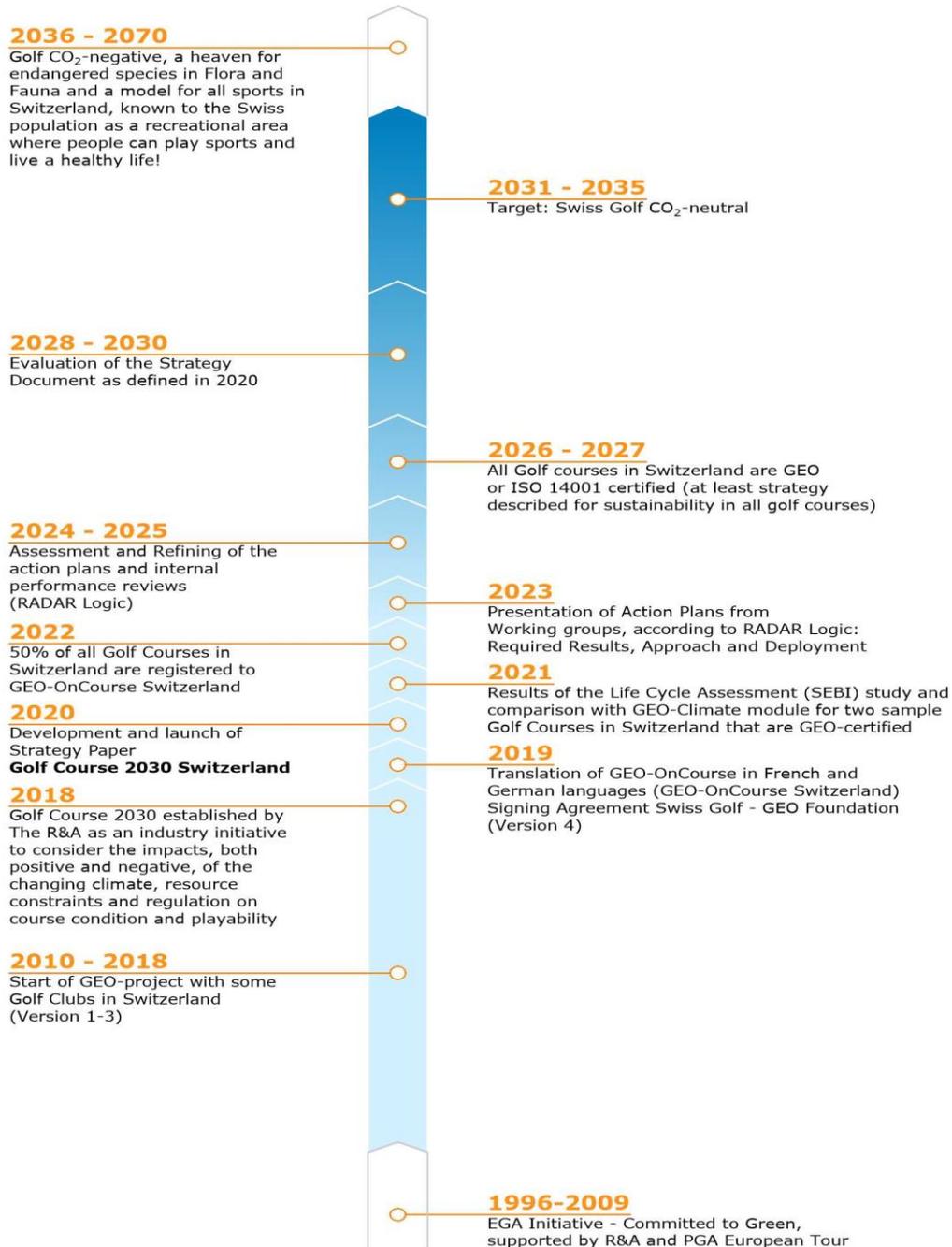
There will be a call for proposals from time to time to encourage project applications against the recommended actions in the Action Plans. The industry stakeholder group and other organisations known to Swiss Golf capable of submitting a proposal will be contacted direct, and the calls will also be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

Once complete, reports from Action Plan projects will be posted on the **Golf Course 2030 Switzerland** section of the Swiss Golf website and shared via social media.



**Figure No. 2:** Zauneidechse (*Lacerta agilis*) on the Golfpark Otelfingen (Quelle: Isabelle Joss).

## Project Timeline 8





## Acronyms

ASGI	Association Suisse des Golfeurs Indépendants
ASGM	Association of Swiss Golf Managers & Directors
BAFU	Bundes Amt für Umwelt
BAG	Bundes Amt für Gesundheit
BASPO	Bundes Amt für Sport
CO2	Carbon Dioxide
EGA	European Golf Association
EIGCA	European Institute of Golf Course Architects
FEGGA	Federation of European Greenkeepers Associations
GEO	Golf Environment Organization
GolfGIS	Golf Information System
IGF	International Golf Federation
IP	Integrated Production
ISO	International Standardization Organization
KARCH	Koordinationsstelle für Amphibien & Reptilienschutz Schweiz
KPI	Key Performance Indicator
LKS	Landschaftskonzept Schweiz
NGO	Non-Governmental Organization
PGA	Professional Golfers Association
PUSCH	Praktische Umweltschutz Schweiz
RADAR (Logic)	Required Results Approach Deployment Assessment Refine
SDG	Sustainable Development Goals
SEBI	Specific Eco Benefit Indicator (by Umtec Technologies AG)
SECO	Sekretariat für Wirtschaft
SGA	Swiss Greenkeepers Association
STRI	Sports Turf Research Institute
STERF	Scandinavian Turfgrass and Environment Research Foundation
UN	United Nations
VSS	Voluntary Sustainability Standards
WWF	World Wildlife Foundation