



United Nations
Environment Programme



*A Centre collaborating with
UN Environment*



• youth &
education
alliance

PLAYING FOR THE PLANET

HOW VIDEO GAMES CAN DELIVER
FOR PEOPLE AND THE ENVIRONMENT



Suggested citation:

Patterson, Trista & Barratt, Sam (2019) *Playing for the Planet – How video games can deliver for people and the environment*. UN Environment/GRID-Arendal. Arendal, Norway

ISBN: 978-82-7701-1899

Acknowledgements:

This assessment was commissioned by UN Environment, in partnership with GRID-Arendal, a centre collaborating with UN Environment. Sam Barratt, Chief, Environmental Education, served as commissioning editor of the project, under the overall guidance of Monika MacDevette, Deputy Director, and Susan Gardner, Director, Ecosystems Division.

UN Environment would like to thank Trista Patterson, author of this report, as well as Janet Fernandez Skaalvik from GRID-Arendal, Jude Ower, Nisha Kadaba and Lou Fawcett from Playmob, as well as Cristian Mazzei, Trine Rosa and Bryan Michuki from UN Environment for their valuable research inputs.

Several people provided substantive comments and support, including: Ado Lohmus (Government of Estonia), Tim Brown, Luis Rodriguez, Lara Barbier, Harald Sverdrup, Anders Nordby, and Tom Wijman.

The cover and layout design was done by GRID-Arendal. Maps and graphics were produced by Nieves Lopez.



Norwegian Ministry
of Climate and
Environment

UN Environment and GRID-Arendal are grateful for the financial support provided by the Governments of Sweden and Norway.



17 Sustainable Development Goals (SDGs) were set by the UN General Assembly in 2015 and are used to structure targets and engagement.

PLAYING FOR THE PLANET

HOW VIDEO GAMES CAN DELIVER FOR PEOPLE AND THE ENVIRONMENT

How can the fastest growing media platform in the world be harnessed to deliver on the Sustainable Development Goals and the urgent global needs they represent? We've summarized recent relevant developments in the video games sector, perspectives from over 50 thought leaders from the industry, and extracted seven recommendations to provoke new thinking, new collaborations, new games and real-world impact. This assessment presents a vision of how the video game industry, gamers, parents, policymakers and UN Environment can together 'Play for the Planet'.

Executive summary

The video game industry is making a tidal shift towards sustainability. Led by 30 of the most globally influential Triple-A companies in the sector, together with smaller studios of immense creativity and dedication, they form the Playing for the Planet Alliance hosted by UN Environment and GRID-Arendal. Each of these companies are leading by example, having declared substantial, quantifiable, time-based commitments to reduce emissions and waste from operations and game play, and to help gamers make meaningful changes of their own.

Additionally, this group will amplify their influence across the industry, with agreements to collaborate with UN Environment and GRID-Arendal to develop a forthcoming reference guide. This resource pack will support game developers who wish to incorporate climate change and other environment issues into their games, or better understand and reduce the environmental impacts of gaming.

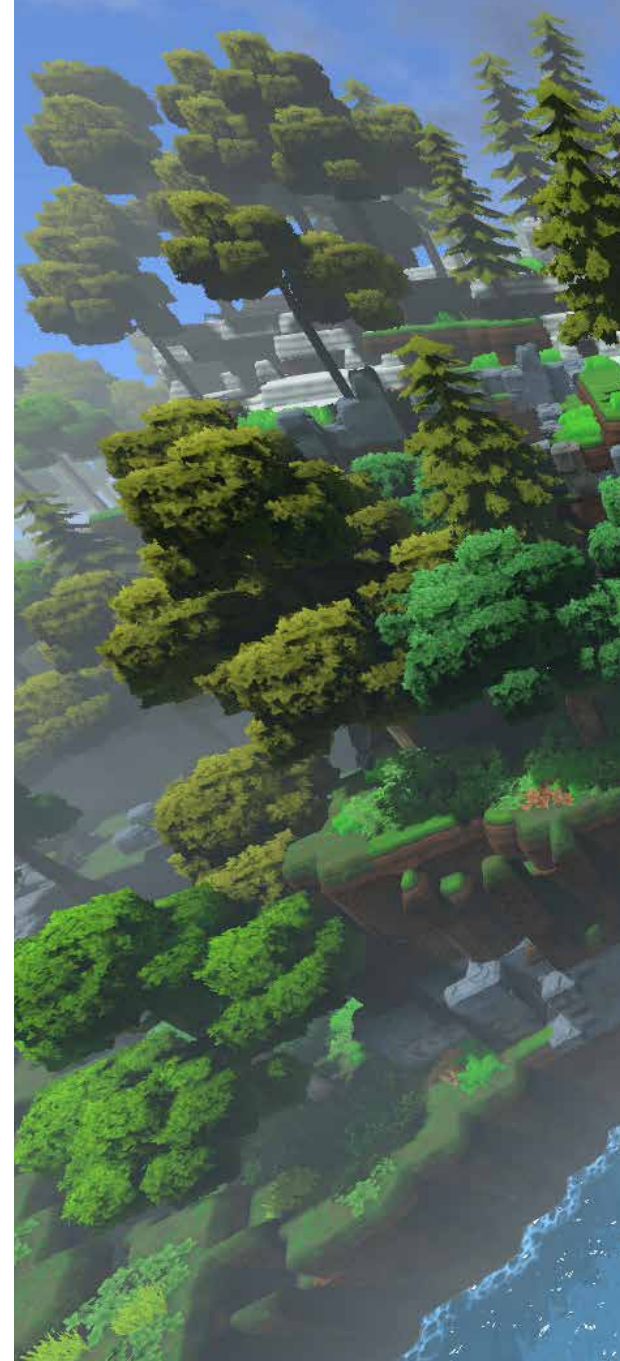
The Playing for the Planet Alliance aims to make visible, industry-relevant impact in two specific areas: goals for restoration of forests and reforestation, and 'nudges' that move companies and individuals towards more planet-friendly choices.

To support the video game industry in actions to help achieve the Sustainable Development Goals, we summarize seven recommendations, further elaborated in this report:

- 1) Include a 'green nudge' in every game
- 2) Create an annual impact season
- 3) Pledge for the planet
- 4) Cut e-waste and go 100% clean
- 5) Fiscal incentives for 'serious' sustainability games
- 6) Team up, reward, and make it famous
- 7) Help parents to engage with their children around gaming

The Playing For The Planet Alliance welcomes your ideas, games, commitments and innovations. Peek inside the back cover for ideas, join us on the web, and let us know:

How will YOU 'level up' for the planet?





©Strange Loop Games



PLAYING FOR THE PLANET

Video gaming is global and growing

Worldwide, over 2.3 billion people play video games.¹ Global citizens spend nearly \$140 billion dollars on games annually, more than three times the amount they spend on cinema.²

Harnessing even a small portion of this activity – in terms of funds, time and problem-solving skills – can create tremendous impact in the real world.³ In the coming years, video games

will drive some of the biggest fundraising events; but this is only the tip of the iceberg. The opportunities that games offer have the potential to be truly transformative, fundamentally changing the way we think about engagement. Many future challenges will require new and innovative approaches that reach beyond the current discourse and beyond those that are currently in charge of decision-making.

A 2011 estimate placed global video game play at over 3 billion hours per week⁴ – over 156 billion hours per year.

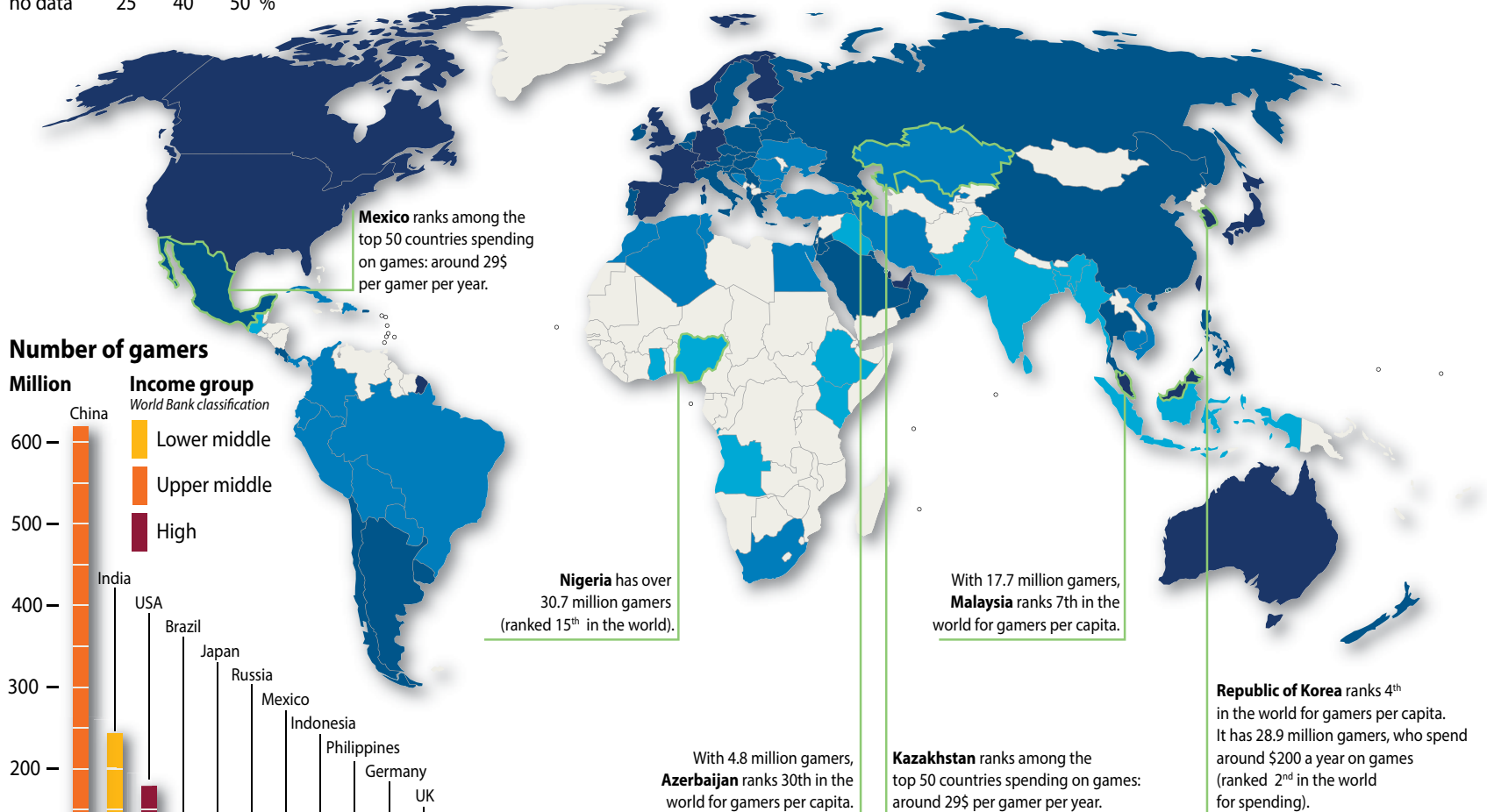
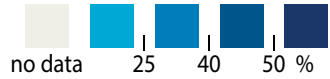
Beyond active playing, video games are also an enormous spectator sport. In 2017, 666 million people watched other people play games on platforms such as Twitch and YouTube – more than the combined audience for ESPN, Netflix and HBO.⁵ Viewers spent 355 billion hours content on Twitch alone in 2017.⁶ In the 'attention economy', the influence of games is without match – at the box office either.

The revenue from video gaming is larger than that from Hollywood,⁷ Bollywood⁸ and worldwide recorded music sales⁹ combined.

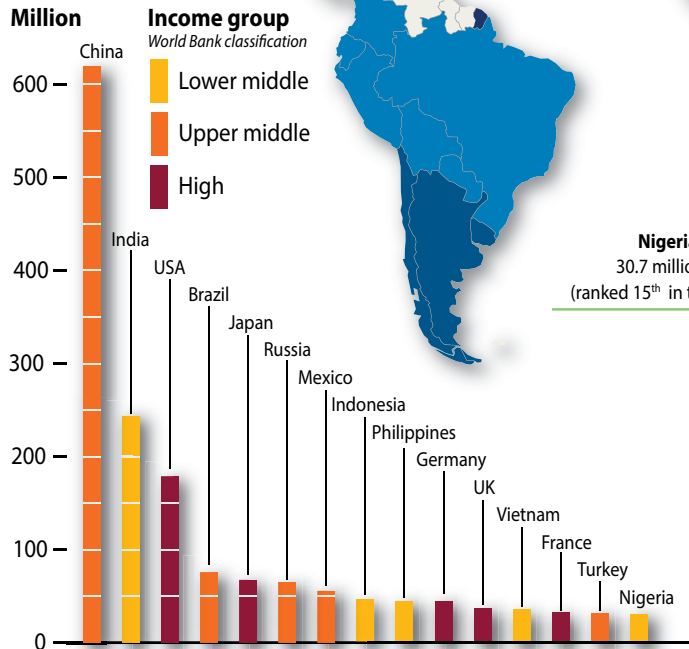


©Block by Block
@iStock/DNY59

Number of gamers as a proportion of total population



Number of gamers



Source: Newzoo Global Games Market Report, 2019.

LÓPEZ, 2019

Video gaming has the potential to trigger huge directional shifts in thinking and in action



@Stock/Deepak Sethi

The gaming industry is projected for double digit annual percentage gains over the next five years.¹⁰ Millions of people will gain access to mobile phones, smart phones and other devices, providing them with more opportunities to play games. Given the scale of the challenges presented by the Sustainable Development Goals (SDGs) for all the planet's inhabitants, compelling, engaging and generationally relevant tools for learning, exploring and problem-solving are needed more than ever. Games are well placed to make an impact, yet have, so far, not been on the radar of the SDG community.

The reach, creativity and problem-solving ethos of the gaming industry constitutes an

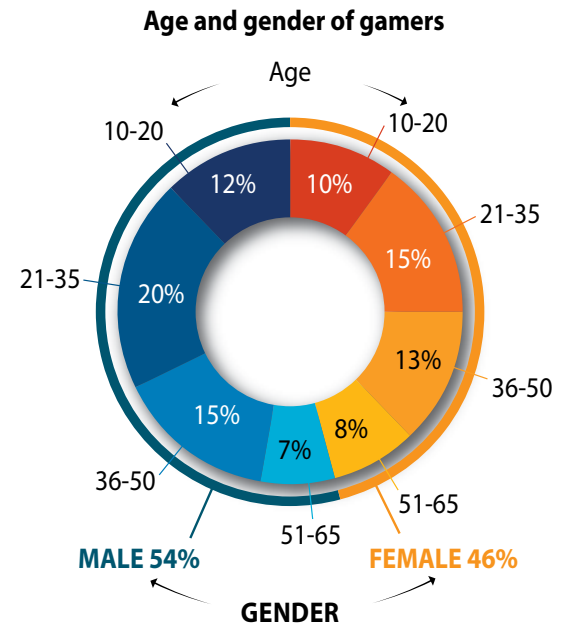
Gaming's ability to mobilize GEN Y and younger is very powerful if executed purposefully.

“ Al Gibb, CEO, Mighty Serious

untapped resource for encouraging engagement in environmental issues. We cannot let our screens distract us; the planet is undergoing unprecedented losses. In the past 40 years alone, world wildlife populations have decreased by 60 per cent.¹¹ Global insect biomass is decreasing at an estimated rate of 2.5 per cent per year.¹² Furthermore, youth are more worried about environmental issues than almost any other. A recent survey of millennials (30,000 individuals under the age of 30 from 186 countries) cite climate change and destruction of nature as the world's most critical issues.¹³ Audience interest in the environment and conservation is strong, and recent school strikes are evidence that students are more than ready to take matters into their own hands. Video games – if seen and approached as serious and transformative tools – could empower billions to contribute to urgently needed solutions.

While 22 percent of gamers are under the age of 21,¹⁴ video games are no longer child's play. Video gaming's demographics, global reach and the technologies used to play games are all changing rapidly. Both the age and gender of gamers are

much more diverse than commonly thought. In fact, in most countries, around half of gamers are female.¹⁵ Gaming is not held back by geography, or limited to high-income countries. Of the 15 countries with the most gamers per capita, 5 are lower middle income¹⁶ (India, Indonesia, Philippines, Vietnam and Nigeria).¹⁷



Source: Newzoo Global Games Market Report, 2019.
LOPEZ, 2019

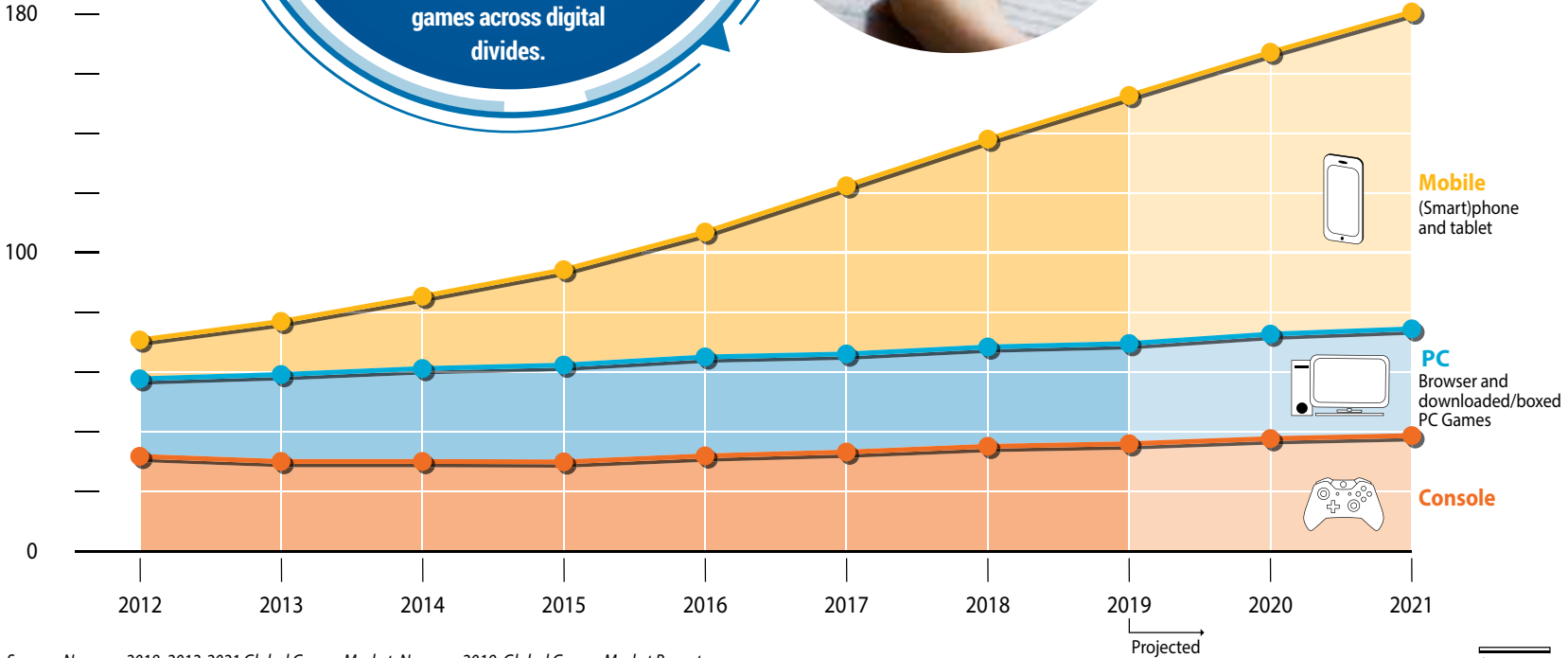
Revenues from mobile phone games surpassed those of console games for the first time in 2015, and are estimated to reach \$91.2 billion by 2021.¹⁸ Brazil, India and China feature prominently.¹⁹ The growth of gaming in most of the world's regions is closely linked to available data speeds. Smartphone penetration is especially varied in some world regions²⁰ and this is anticipated to influence both the participation of gamers and the impact of games across digital divides.



@Stock/Rawpixel

Revenues

US\$ Billions



Source: Newzoo, 2018, 2012-2021 Global Games Market; Newzoo, 2019, Global Games Market Report.

LOPEZ, 2019

Gaming can become the new public service media for the world

The notion of using video games as a means of engagement may seem controversial given that excessive screen time can distance people from nature and healthy activities. Nonetheless, the most effective way to engage youth in solutions will be to embrace the spaces and platforms they use, on their own terms. With gaming poised to be the dominant and most far-reaching media for the emerging generation, its impact and potential can no longer be ignored – it's a platform with unrivalled potential.

While individual projects involving video games have been supported across the UN,²¹ there has, as yet, not been a major attempt by UN Environment to explore how the gaming sector could specifically support the environmental/

SDG agenda.²² At UN Environment, the focus, until now, has been on engaging higher education institutions in support of the delivery of education for sustainable development.

But how does the gaming industry see its role relative to the Sustainable Development Goals, and specifically the environment? There are, in fact, large numbers of companies already active in this space, or conceptually on-board. Of the 53 video game industry leaders surveyed for the document, the majority agreed that video games can successfully raise awareness for a cause (96%), assist awareness and learning (87%) and drive positive behavioural change (74%). Indeed, 87 percent of respondents intend to run more campaigns and promote key environmental messages, underscoring the need for more

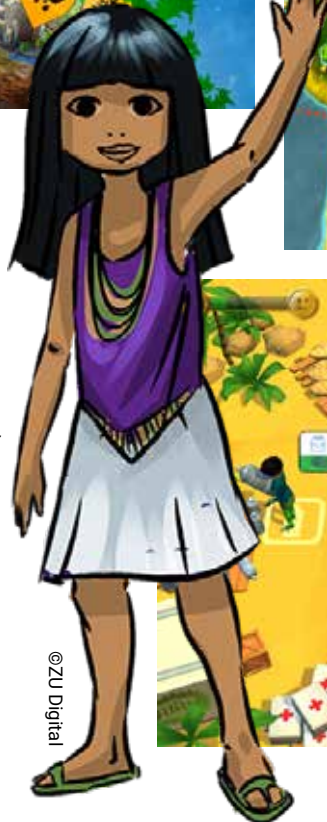
refined input from SDG sector experts to focus impacts and highlight successes. In terms of the thematic areas, respondents felt their companies and campaigns identified most with Sustainable Development Goals of education, gender equality, reducing inequality, health, and sustainable cities.

It is crucial that this engagement includes not only formal education sites (classrooms and campuses), but also everyday spaces, where people connect and, importantly, where they play. With a little re-tooling, or with the strategic placement of information, video games can effectively serve as a public service broadcast medium. Exploring examples where video games are already making an impact can help us re-imagine its potential.





The game, World Rescue, was supported by UNESCO and the Mahatma Gandhi Institute of Education for Peace and Sustainable Development, and was inspired by, and helps teach about the SDGs. Game players help five young heroes tackle community solutions to global problems in fast-paced settings in Kenya, Norway, Brazil, India and China. Assisting game players to confront displacement, disease, deforestation, drought and pollution cultivates empathy in new audiences, and opens new dimensions to the concept of 'think global, act local'.



Video games are already making an impact

Games have already had positive social and environmental impacts. Many companies have used existing games with a mass audience to raise funds for particular causes via in-game purchases and donations. Pokemon Go, a mobile-augmented reality game, recently rewarded participants of 68 Earth Day clean up events in 19 countries with in-game rewards, a 'special release' Pokemon, and a \$250,000 donation to Mission Blue's new Hope Spot in Palau.

Animal Jam, an interactive animal library for kids has over 100 million registered users – 22 per cent of whom are from Latin America and the Philippines – and has donated over \$10 million to animal-related conservation and education initiatives since 2010.

Games can raise not only funds, but also awareness. Many companies release adapted versions of games, 'skins' or characters which support awareness and fundraising. Runescape, a multiplayer online role-playing game, gave players an in-game pet (26,000 digital 'Royal Rhinos') in exchange for answers to their conservation quiz – the most popular new Runescape content of the year.



©Animal Jam

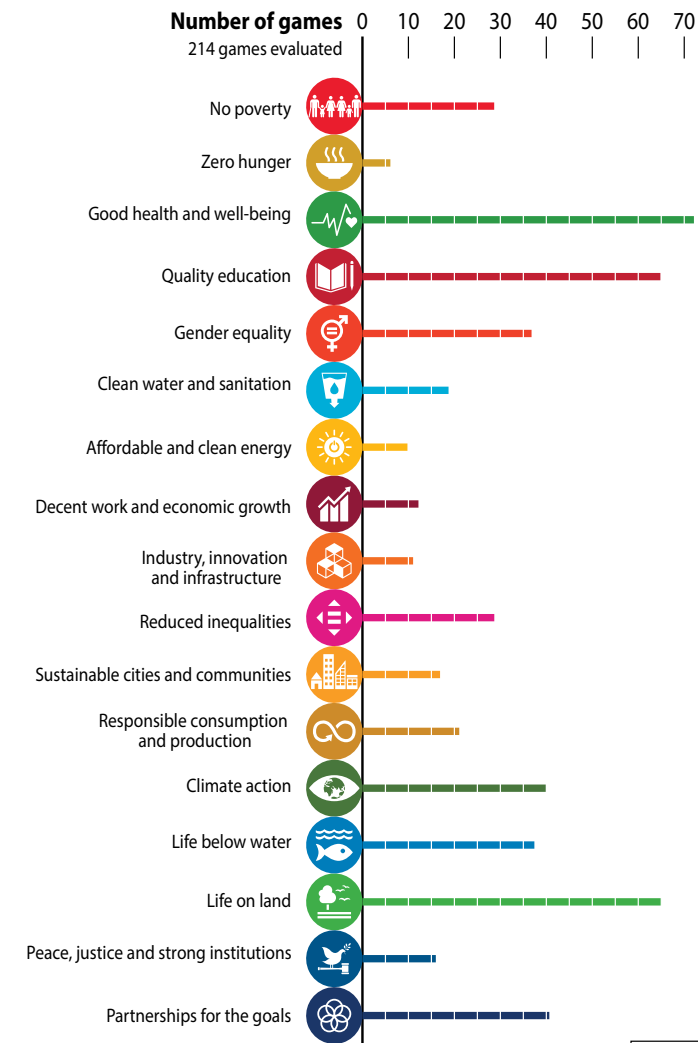


Most big conservation organizations are focused on pursuing big corporate donations and don't understand the reach of a property like Animal Jam. They need to understand that millions of kids every month would be engaging much more deeply with their work than they ever will through newsletters or school fundraisers. So far it's been difficult to get these organizations to partner with us unless there is an up-front six-figure donation attached.

“ Animal Jam

Which Sustainable Development Goals are most represented in games or game initiatives?*

*Games evaluated not exhaustive, games can have multiple SDGs



Source: Playmob, 2019, unpublished data.

López, 2019



@Block by Block

@Block by Block



@Block by Block



Minecraft, the blockbuster 'building block' game, was released as 'Minecraft-Climate Hope City' to help players envisage a zero emissions future. It also supported real-world public commentary in media articles on fossil fuel divestment debates. The funds raised by the game were used to plant 150,000 trees across East Africa.

However, focusing on gaming as simply an extractive opportunity for fundraising, ignores the huge collaborative opportunities it offers. The exponential growth in audience reach presents enormous potential for engagement.

Games are often self-explanatory and intuitive, features which can benefit environmental projects, especially in terms of accessibility and social inclusivity. The UN-Habitat sponsored project 'Block by Block: Making a difference with Minecraft', uses the simple building block game originally designed for children to create an exercise in interactive community-building, based around different SDG goals. Players, often from a demographic that has traditionally been excluded from decision-making processes, create their vision of a future home, city or community.²³



Microsoft via the Minecraft 'Build a Better World' initiative has engaged more than 20 million in-game actions to trigger donations to biodiversity, oceans and clean water. Minecraft Earth, the latest Augmented Reality version, creates new potential for activations, collaboration and integration in the real world.

These, and many other examples, show how private and public sector groups can come together to create popular games with a real-life impact. Partially funded by the US Department of Education, Eco, an online multiplayer game uses ecosystem simulations to help the player think about the consequences of their resource consumption. It was ranked the number one game of 2018 by technology news site Venture Beat.

Eco made me realize that games are actually crucial for understanding our relationship to all kinds of natural and man-made systems. The thing that gives me [the] chills is that I think it is only in games that we can play with economic systems. And I walked away from my experience in Eco feeling like I [had] learned so much even though we had no instructor. No one was connecting the dots for us. We simply learned through play.

“ Jeffrey Grubb, GamesBeat PC, gaming editor²⁴





@Internet of Elephants

In addition to engaging users on specific themes, the gaming sector can work not just on the big issues, but also on micro-projects. Riot Games, hosts in-game fundraisers that specifically support local causes in various countries. The effort is based on the SDG's and allows players to participate in and support local outcomes.²⁵

Even small investments can have big impacts. Safari Central, developed by Internet of Elephants, a video game development company based in Nairobi, uses augmented reality to bring kids closer to wildlife as they place elephants, bears and pangolins in 3D locations. With minimal marketing, the game continues to see around 10,000 downloads a month.



@Rovio

Even the Angry Birds are being called in to help. The UN Secretary-General Ban Ki-moon named 'Red', a character in the Angry Birds Movie, as UN "Honorary Ambassador for Green" to urge people to act on climate change and its adverse effects.²⁶



@UN Web TV

Diverse game markets and game genres offer a variety of strengths to be tapped

All **game markets** can create SDG impact. As the examples above illustrate, pure **Entertainment games** can introduce new characters (e.g. adopted rhinos in Runescape), or support an in-game fundraising campaign (e.g. Angry Birds with BirdLife International) or modify a whole platform (e.g. SimCityEdu) to reach enormous audiences. More **Serious games** can be designed to entertain while also conveying a message or support exploration of a landscape or concept (e.g. Eco). **Educational games** are most often designed with specific environmental learning goals in mind (e.g. i-Biome Ocean).

Many **game genres** excel at conveying concepts and perspectives of interest to SDG audiences, a few are mentioned here. **Simulation games** (e.g. Eco, Sim-Earth, Farming Simulator) often involve gameplay about building systems, where gamers can test scenarios, often zooming out to see a broader 'world'. They excel at helping people explore options, weigh trade-offs, consume virtual possessions and resources, and design potential future worlds (perhaps with far lower footprint than the present). **First-person games** can allow a gamer

to adopt a new perspective, and in some cases, build empathy.²⁷ **Multi-player games** excel at building/drawing off of social capital in a gaming community. Adventure games allow a gamer to learn while exploring or meeting a challenge (Neveralone, GetWater). **Online Multiplayer games** (WoW, Fortnite, Minecraft) allow for global game play and projects where players can collaborate and compete across the world. When strategically oriented, these platforms can unite global citizens toward shared and global goals like never before.



Neveralone features an Iñupiaq girl Nuna and her Arctic fox companion in challenges that feature traditional indigenous knowledge and experiences in the arctic ecosystem.

©E-Line Media



©E-Line Media

Video games can help us think differently – as individuals, communities, and as the world at large

Video games can deliver new information about a range of topics such as health, crops, markets and wildlife, putting new tools in the hands of youth living at the edge of the digital divide. They are increasingly using puzzles, problem-solving and simulations to draw attention to real and formerly intractable issues such as climate change, HIV and species conservation.

Gaming may either attract people who particularly enjoy puzzles and challenges, or it may be the case that the 'Internet/gaming generation' are fundamentally 'thinking differently' as pervasive use of the internet impacts on brain plasticity.²⁸ If cognitive styles

After scientists and supercomputers failed to resolve the structure of an AIDS-like virus for over a decade, game designers focused gamers on the challenge. "Foldit"³¹ players, collaborating and competing to rotate 3-D chains of amino acids online, solved the enzyme structure in just 10 days.³²

Given that the environment is itself wickedly complex, I think game-worlds have a huge potential for showing how change can ripple through systems; perhaps the first time in my life I truly grappled with the problem of industrial pollution was when I played the original SimCity and Civilization!

“ Tom Chatfield, Author, Fun INC

have shifted, changing the way we view the world and the way we learn and communicate, then efforts to harness or 'crowdsource' these abilities must similarly evolve. Deep and persistent social challenges, such as those presented by the Sustainable Development Goals, can and must be built into games and gamified formats.

Versions of SimCity, CityOne and Civilization have already been modified to explore ecological concepts and social development goals.²⁹ Games can also be used to raise awareness of the connections between everyday actions and their ecological impacts, to help people understand the trade offs and impacts that result from their day-to-day decisions.³⁰ However, to expand on this potential, academics and SDG practitioners need to elaborate on concepts and case studies that are well-suited to games and gaming's immersive storytelling, for easier uptake by the gaming industry.

Aqua Republica, co-funded by UNEP-DHI, is an online strategy game where players (alone or in groups) plan and develop a river basin, attempting to create prosperity while maintaining the environment. The game has been played by almost 10,000 people.



©Aqua Republica

Serious games that are well designed yield 'meaningful play', a condition very much like learning...[they] engage players... and educate them about complex relationships.

“ Aqua Republica³³

Video games can tip the balance towards sustainability

The potential of video games to bring about positive global change has yet to be tapped. Not only can the industry reach vast audiences, but it can engage on a whole new interactive level, in comparison to other forms of media. Games support a myriad of virtual communities, many of which can be used for good in the real world through the use of in-game problem-solving, collaboration, simulation and immersive educational experiences.

The New York Times front-page feature, “You Fix It: Can You Stay Within the World’s Carbon Budget?” gave readers an interactive tool to explore 8,000 climate change solutions. Developed by Climate Interactive, the simulation model also supports the World Climate Simulation Game. Players adopt roles of different countries setting reductions commitments on greenhouse gases and negotiate to meet emissions goals. Studies documented improved awareness of complexity and negotiations following game play.³⁴

Two key strengths of digital games are their interactive nature and capacity for simulation. Our potential is to use games to engage, educate and involve the public in areas of social need. Most game developers don’t realize they have the power to do this and the leverage to heal the world.

“ Trip Hawkins, Founder Electronic Arts



©Climate Interactive/flickr CC BY-NC-SA

Crucially the World Climate Game format increases the speed of the feedback between the players and an emissions graph of the net results of their “climate commitments” (an important feedback missing in real-world negotiations). As the ‘scoreboard’ changes over time, this feedback forms important motivation as players continue to represent their sector but unite to achieve the ‘group goal’.



©Climate Interactive/flickr CC BY-NC-SA

Gaming technology and Virtual and Augmented Reality can be used in research and education

The sophistication of modern game engines and modelling tools are opening new avenues in research and education. 3D modelling packages such as Houdini³⁵ enable creation of highly photo-realistic physics-based models of the environment. New advances in drone technologies, on-phone 3D reconstruction and computer vision, enable semi-live, high resolution 3D scans of the environment for visually stunning games that incorporate both real world and visualization of environmental data.³⁶

Virtual and Augmented Reality (VR/AR) are powerful tools for delivering immersive, emotionally impactful educational experiences. **VR** gamers can explore remote real-world locations or experience rainforests, villages, or refugee camps. **AR** can bring hidden or otherwise unavailable data into the real world to show potential impacts of sea level rise, or can make nature or science more engaging. **"Gamification"** is a technique that integrates game attributes in non-game contexts. Zooniverse, the world's largest citizen science

platform, has enabled the research community to engage its 1.6 million users in everything from classifying galaxies to counting seals.³⁷ Gamification has also engaged citizens in topics from energy efficiency to recycling.

Combining the above approaches offers untapped opportunities to merge gaming and real world research to not only engage and educate gamers, but also conjure excitement and visions for global solutions.



©Ubisoft/Far Cry 5



©William Kezele, Danforth Plant Sciences

A proposed VR/AR interface for enabling NextGen analysis of agricultural data and genomics.

*Realistic environment
Far Cry 5.*

The private and public sector must partner up to create impact

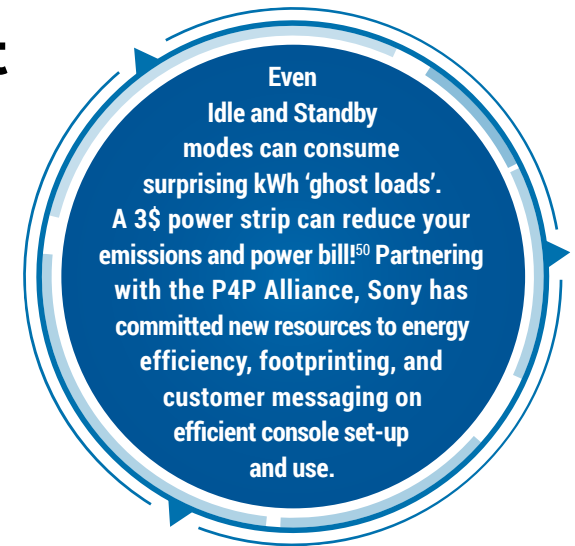
Public and private sectors and gamers must come together to reduce gaming's environmental footprint. Gaming's carbon footprint is large and growing rapidly. In 2016, worldwide online gaming traffic reached 915 petabytes per month and is the world's fastest growing sub-segment of data usage.³⁸ Projected to grow another 62 per cent (over 10,000 petabytes per month) by 2021, gaming Internet traffic will be greater than all web, e-mail

Corporations that sell globally sometimes set the 'rest mode' on their consoles according to perceived regionalized 'habits' and consequent estimates of market demand. As a consequence, the default setting of a console sold in the US can consume 12.5 times the energy of the same console sold elsewhere in world. Corporations can commit to exporting components with energy efficiency settings as the default. Consumers can also take matters into their own hands: customizing rest-mode functions on consoles is one of the easiest ways to reduce energy consumption from gaming. Disabling the USB charging function of a PS4 reduces the 8.5 watt rest mode to 5.5 watts, and users can set consoles to disable USB charging completely after 3 hours.⁴⁹

and data traffic in 2016.³⁹ This data flow creates a legacy of emissions that needs to be addressed. Game purchases have increasingly shifted from physical packaged games towards digital downloads. Between 2009 and 2017, US sales went from 20 to 79 percent digital.⁴⁰ Similar shifts worldwide have reduced the environmental footprint of software purchases, particularly where green energy and rapid Internet speeds are available.

Companies like Supercell, who are behind games such as Clash Royale, have recently made a commitment to go entirely carbon neutral and offset the CO2 used by players when they charge their devices. As CEO, Ilkka Paananen, explains, *"The biggest challenge facing all of us, no matter what industry we're in, is climate change and so that's where we must try to make the biggest impact.... there aren't any easy wins. That's why we decided this year to make Supercell entirely carbon neutral.... this is a small step in the big scheme of things, but we hope that it can be the beginning of something important if more and more studios do the same"*.

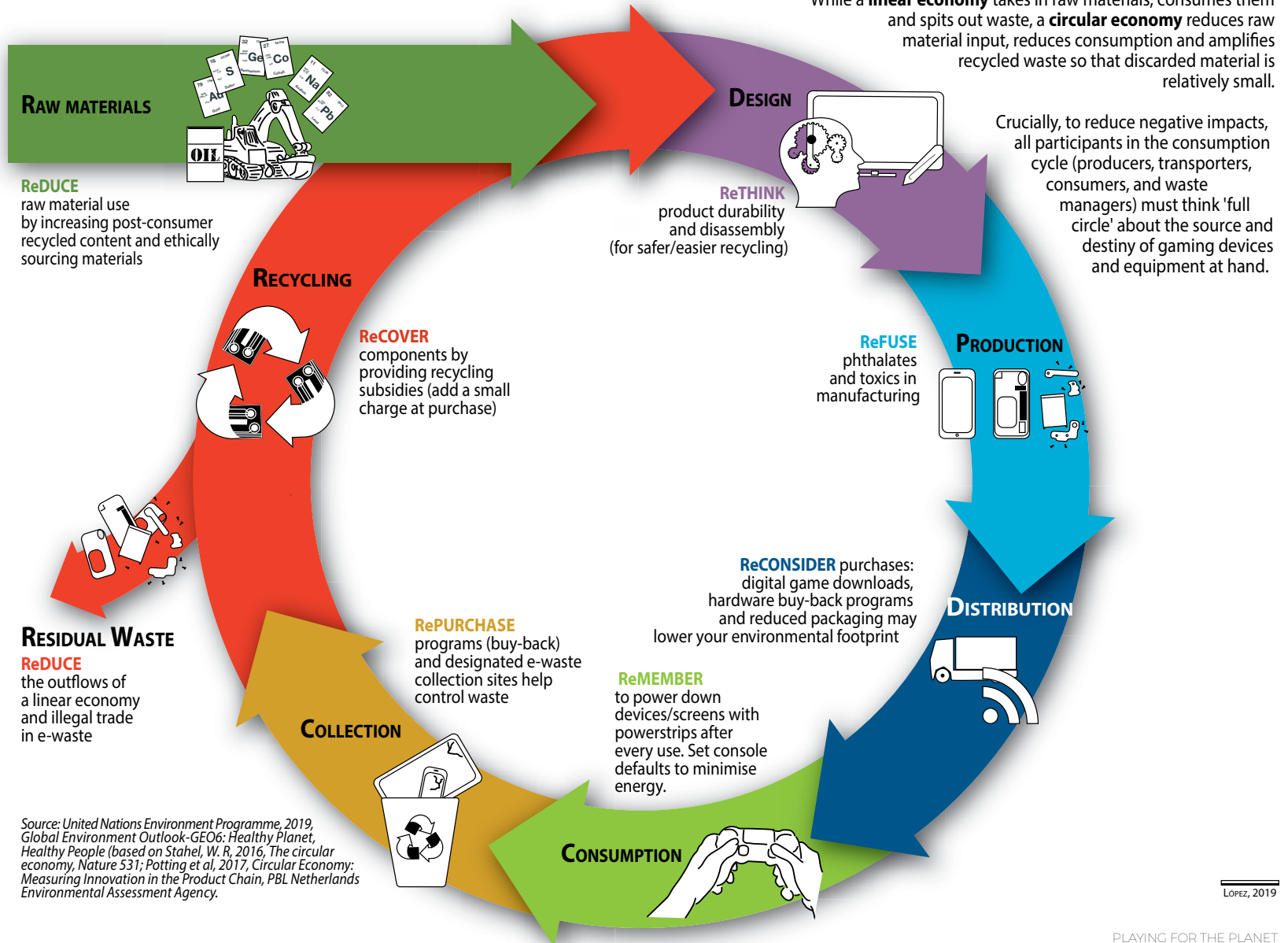
E-waste is increasing at an alarming rate (from 50 million tons today to a projected 120 million tons by 2050)⁴¹ and is a serious concern in terms of both local impact and as an unresolved issue in UN treaty forums. With most electronic equipment around the world averaging only five years in use,⁴² e-waste or electronic waste is one of the world's



fastest growing waste streams.⁴³ Globally, less than 20 per cent of e-waste is recycled.⁴⁴ A half of all e-waste is made up of personal devices such as computers, mobile phones, tablets and TVs, which are also used as gaming hardware.

Corporations, gamers and policymakers can apply 'circular economy' principles to reduce gaming's environmental footprint. The gaming industry can commit to leading on e-waste prevention (integrated design), user education and recycling/buy-back programmes.⁴⁵ The private and public sector needs to work together to develop national policies that support a circular economy for e-waste – as in Japan.⁴⁶ Reclaiming and recycling e-waste materials is not only good for the environment, it can also generate large revenues. Today's discarded material is collectively worth around \$62.5 billion,⁴⁷ yet, on average, only about 20 per cent of this is recycled.⁴⁸

Circular Economy for Video Game Devices (e-waste considerations)



Source: United Nations Environment Programme, 2019, Global Environment Outlook-GEO6: Healthy Planet, Healthy People (based on Stahel, W. R, 2016, The circular economy, Nature 531; Potting et al, 2017, Circular Economy: Measuring Innovation in the Product Chain, PBL Netherlands Environmental Assessment Agency.

Recommendations

Video games are seen as a form of entertainment, and as such have been overlooked in environment and development circles. Rethinking the role of games, and gamers, is therefore as much a social and creative challenge as it is a technological one. It requires re-imagining and empowering a relatively untapped resource: a community and industry that is global, young, technologically savvy, playful and innovative.

There needs to be a shift in mindset among policymakers and environmental practitioners, to acknowledge and empower gamers as rapidly emerging global change agents. A similar shift may be needed in the gaming industry, where a more diverse range of attributes (that resonate with and reflect audience values) can help a new game attract attention, make headlines and stand out in a crowded market.

Engaging the whole of the gaming industry on this issue is critical for securing impact. Shifts in game content must be supported by promotional and marketing budgets that can help the game reach a mass audience. Scientific collaboration can identify real-world challenges that appeal, in a playful manner, to intelligent minds, and can help focus 'down time' on things that really matter. This can also help generate social capital, engagement, a more purposeful use of time and a sense of reward – many of the elements associated with gaming communities.

Insights from leading companies in the games sector can provide a vision – in the industry's own words – of how gaming could be harnessed to create a meaningful impact for people and the planet.

It is our hope that the examples featured here serve an additional purpose: to inspire educators, UN partners and environmental practitioners to develop more playful, engaging and immersive methods for encouraging collective action across the world.

To support action on the SDG agenda, seven recommendations have been compiled from the industry survey and in consultation with experts:

1) Include a 'green nudge' in every game

While the primary objective of games is to entertain and grab the attention of players, it also has the power to educate without disrupting the flow of the gaming experience. This could involve the use of nudges such as:

Power-off for the planet: Reminding players to switch off or reset console defaults so that they consume less power (in exchange for points) could be a quick-fire way to save energy.

Points for plants: In many games, such as Fortnite and Clash Royale, trees are destroyed as gamers march through the levels. Tweaking the experience so that points are awarded

for protecting the environment, rather than pulverizing it. Alternately, offering a badge for conserving resources, could encourage gamers to value nature.

Incentives for 'positive planetary play': Whether it is picking up plastic, choosing a non-meat dish in Cooking Fever or using game techniques to make electric cars 'desirable', targeted messages embedded in game 'media time' can influence offline behaviour.

2) Create an annual impact season

Organizing month-long campaigns, where the industry comes together to mobilize its community around a particular theme, could help transform the perception of the industry to one as a major agent of social change. Individual initiatives – such as those organized by Niantic – already take place, but organizing a mega-event around an environmental theme would add significant value. Working with app stores to promote the games taking part in the season, and theming stores such as Apple have done with 'Red' and WWF, would help promote both the campaign and the participating games.

3) Pledge for the planet

The financial reach and influence of the gaming sector is enormous and huge sums of money are being raised. But if the gaming industry acted as a consortia to raise \$1 billion to

support specific Global Goals, the momentum would drive and sustain changes at a different systemic level entirely. Whether it was in the form of in-app purchases, donating a portion of profits or pro bono media space, there is huge fundraising potential in the industry. From large to small, established to emerging, platforms, companies, and studios have complimentary roles to play. Some game distribution platforms disallow commercial app publishers to openly raise funds for nonprofits through in-app purchases (apps must be free and collect funds outside the app via Safari or SMS). More platforms could emulate popular sites like Humble Bundle, a digital storefront for video games, which offers collections of games for a set price with a portion donated to charity. Industry aggregation initiatives have amplified impact in other sectors. A model of note is OnePercentForThePlanet.org which raised over \$175 million USD since 2002 by securing commitments from outdoor companies.

4) Cut e-waste and go 100% clean

Well written gaming narratives have the power to change perceptions – turning obstacles into challenges to be defeated. Gaming contributes unnecessarily to emissions and e-waste, both of which harm real people in present day. Yet there is too little traction for action – in great part because it is difficult to conceptualize where e-waste goes, once disposed. Examples in this document cover how different types of games

can be used to engage gamers in taking on this challenge. In addition, the gaming industry can also directly reduce costs, emissions, and footprints through circular economy. But the company that helps its consumers align purchase and playing decisions with stories, games and situations they feel good about, brings the story full circle with customer and employee loyalty that also supports the bottom lines.

5) Fiscal incentives for 'serious' sustainability games

While the gaming industry excels at engaging and holding attention and driving audiences, serious games are often starved of investment. Fiscal incentives, such as subsidies for 'serious' sustainability games could assist. Well-designed government initiatives can promote outcomes that lower costs borne by society, and seed early desired development. By way of illustration, in 2014 the UK launched a Video Game Tax Relief program for games that support UK cultural relevance, funding 480 games since then. In a similar vein, games that link to environmental messages could be supported in order to encourage more game developers to integrate green messages, raise awareness and inspire action among gamers. Because user acquisition is often a daunting challenge and expense for developers, governments could also offer tax breaks for marketing socially desirable games (i.e. beyond just the start-up phase) so games reach the largest audiences possible.

6) Team up, reward and make it famous

Team up: Gaming is probably the one of the most collaborative and global experiences today. The benefits of working with other gaming companies to share successes and tackle challenges builds social capital, creativity and critical thinking for companies far beyond the philanthropic goals they may share. Teaming up would have particular value if it crossed disciplines (ie. Scientist/game developer/ teacher) and focused on a major challenge facing the world.

Reward: Games reward players, but the industry rarely rewards itself. An industry advisory board, a game developers' philanthropic survey, and an annual award for 'best environmental game', 'best new SDG game' or 'gamer's footprint award' could help raise the profile of small start-up companies – which is particularly important during the crucial early stages of their game release.

Make it famous: Working with gaming stars who have a massive reach and influence on young people was suggested by a number of respondents to the industry survey. Their role in supporting 'climate-smart' behaviour (reducing energy use or sustainable lifestyle choices) would ripple out far and wide. But it doesn't just have to be the gaming stars. Developing the green credentials of popular game characters – Sonic, Mario or Lara Croft, for example – could inspire gamers to 'do their bit'.

7) Help parents to engage with their children around gaming

Parents are crucial advocates in creating the next generation of aware digital consumers, helping children to seek out, and even create the good content and the change they want to see in the world. While every generation has its concerns about the type and time spent by the next generation on technology, the pervasiveness of screens, and the addictive nature of games, can be particularly daunting for parents. Yet many parents who monitor their children's television consumption closely, often do not monitor, discuss or engage with their children on video game content to the same degree. Parents can be encouraged to play video games with their children, both for 'fun' and to explore, discover, discuss, and seek out enriching content together. Interaction is crucial to establishing links between games and the change they can create, and help children see challenges and the world around them with new eyes, and empowered minds. Video games can help leave the planet on a better trajectory than the one its been on for generations, particularly if (outdoors and in) we play together with our children.



©Stock/DGLimages

Levelling up: This is an industry uniquely game to create change

Leaders of video game companies in the Playing for the Planet Alliance agree: climate change is one of the most important issues of our time. Actions that help cut back on carbon emissions – such as switching to renewable energy, building energy efficiency into platforms, and designing for a circular-economy – can not only translate into enormous cost savings, but also inspire employees and game communities alike.

UN Environment and GRID-Arendal are partnering with game companies to develop a forthcoming Game Developer Guidance Resource with practical advice to the industry for reducing carbon footprints and taking an EAST (Easy, Attractive, Social and Timely) approach to 'nudges'. Topics under development

A carbon footprint is a measure of the amount of greenhouse gases (GHG) produced by an entity or organization.

The IPCC-endorsed Greenhouse Gas Protocol (GHGP) provides accounting and reporting tools and standards for the private and public sectors, but there is currently no established, specific guidance for measuring the footprint of the game industry and no system for assessing the energy used in video gaming.

include shifts to renewable energy, footprinting business operations, data centers, game distribution and updates, and activating game communities to reduce energy costs, wastes and emissions.

For a video game company, the main categories of a carbon footprint will likely include: business travel; employee commuting; electricity for office operations, heating and cooling; goods made by or purchased by the company (including design, extraction, production, transport, distribution and disposal); capital goods acquired by the company; disposal and treatment of waste; and power for servers and data centers. Most video game companies also estimate emissions from their gamers charging or powering game devices (mobile, PC, screens and consoles). Importantly, actions to reduce a game company's environmental impact can also encompass 'green nudges' embedded in games, equipment settings, user manuals, and customer support and game community facilitation.

The games industry has always been led by future-forward, inventive, agile and imaginative problem-solvers who relish challenges and opportunities. Similarly, the companies that set and meet clear, ambitious climate goals will be best-positioned to serve the consumers of the future and change the world through play.

10 steps for a video game company to become 'carbon neutral'

- 1) Think big!
- 2) Define the scope of accounting (in activity, product, geography, time)
- 3) Gather data about your carbon footprint
- 4) Declare an ambitious commitment for cutting emissions, for one year and beyond
- 5) Empower your workforce (top to bottom) to propose/implement solutions
- 6) Where emissions can't yet be cut, purchase offsets
- 7) Engage a third-party organization to verify your cuts
- 8) Report your progress publicly
- 9) Share your strategies and successes with other companies
- 10) Revise, ramp up, and repeat

Notes

1. Newzoo (2019). Global Games Market Report, January 2019. www.newzoo.com
2. Motion Picture Association of America (MPAA) 2018. 2017 Theme Report. Accessed Feb 13, 2019. https://www.mpa.org/wp-content/uploads/2018/04/MPAA-THEME-Report-2017_Final.pdf
3. Gee, J. P. (2007). Good video games + good learning : collected essays on video games, learning, and literacy. Peter Lang Publishing, New York.
4. McGonigal, J. (2011). Reality Is Broken: Why Games Make Us Better and How They Can Change the World. Penguin Books. London.
5. Superdata (2017). Gaming Video Content and the New Essential Audience. Accessed Mar 1 2019. <https://www.superdataresearch.com/market-data/gaming-video-content/>
6. WEPC (2019). 2019 Video Game Industry Statistics, Trends & Data. <https://www.wepc.com/news/video-game-statistics/#video-gaming-industry-overview>, Accessed Mar 5, 2019.
7. Motion Picture Association of America (MPAA) 2018. 2017 Theme Report. Accessed Feb 13, 2019. https://www.mpa.org/wp-content/uploads/2018/04/MPAA-THEME-Report-2017_Final.pdf
8. EY (2018). Re-imagining India's media and entertainment sector. Accessed Mar 5, 2019. <https://www.ey.com/Publication/vwLUAssets/ey-re-imagining-indias-me-sector-march-2018/%24File/ey-re-imagining-indias-me-sector-march-2018.pdf>
9. IFPI 2018. Global Music Report 2018: State of the industry. Accessed Mar 1, 2019. <https://www.ifpi.org/downloads/GMR2018.pdf>
10. NPD (2018). NPD Group/Games Market Dynamics Report, January through June 2018. Accessed Feb 26, 2019. www.npd.com
11. WWF (2018). Living Planet Report - 2018: Aiming Higher. Grooten, M. and Almond, R.E.A. (Eds). WWF, Gland, Switzerland. Accessed on Feb 13, 2019. https://www.wwf.org.uk/sites/default/files/2018-10/wwfint_livingplanet_full.pdf
12. Sánchez-Bayo, F. and K. G. Wychhuys (2019). Worldwide decline of the entomofauna: A review of its drivers. *Biological Conservation* Volume 232, April 2019, Pages 8-27
13. World Economic Forum (2018). Global Shapers Annual Survey 2018. Accessed Feb 12, 2019. http://www.shaperssurvey2017.org/static/data/WEF_GSC_Annual_Survey_2017.pdf
14. Newzoo (2019). Global Games Market Report, January 2019. www.newzoo.com
15. *ibid.*
16. World Bank (2019). World Bank Country and Lending Groups. Accessed Mar 1, 2019. <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>
17. Newzoo (2019). Global Games Market Report, January 2019. www.newzoo.com
18. Newzoo (2019) Global Games Market Report: quarterly update, October 2018. www.newzoo.com
19. Newzoo (2019). Global Games Market Report, January 2019. www.newzoo.com
20. <http://www.pewglobal.org/2018/10/09/majorities-in-sub-saharan-africa-own-mobile-phones-but-smartphone-adoption-is-modest/>
21. E.g. World Rescue (UNESCO), Block-by-block (UN Habitat), Aqua Republica (UNEP-DHI), EVOKE (World Bank), among others
22. A few sites have aggregated SDG games and 'eco' video games <https://games4sustainability.org/gamepedia>, <http://www.teachsdgs.org/blog/sdgs-board-game-sustainable-ideas-game-sig>, <http://www.ecogamer.org/>
23. <https://www.blockbyblock.org>
24. Venture Beat (2018). The 10 best games of 2018, accessed on March 1 2019. <https://venturebeat.com/2018/12/28/goty-2018/>
25. Jeffrey Burrell, Head of Karma (Social Impact), Riot Games. Personal communication.
26. <https://newsinfo.inquirer.net/775099/angry-birds-character-red-named-un-ambassador-to-tackle-climate-change>
27. Farber, Matthew & Schrier, Karen (2018). The Limits and Strengths of Using Digital Games as "Empathy Machines". UNESCO /Mahatma Gandhi Institute for Peace and Sustainable Development working paper. Delhi, India.
28. Prensky, M. (2007), Digital Game-Based Learning, Paragon House, the United States
29. Costanza, R. et al. (2014). Simulation games that integrate research, entertainment, and learning around ecosystem services. *Ecosystem Services* 10: 195-201.
30. *ibid.*
31. <https://fold.it/portal>
32. Cooper, S., Khatib, F., Treuille, A., Barbero, J., Lee, J., Beenen, M., Leaver-Fay, A., Baker, D., Popović, Z. (2010). Predicting protein structures with a multiplayer online game. *Nature*. 466 (7307): 756–760.
33. <http://aquarepublica.com>
34. MIT news, December 7, 2015. Climate negotiation role-play in Paris feels like the real thing. Accessed on Feb 26, 2019. <http://news.mit.edu/2015/climate-negotiation-role-play-paris-feels-real-thing-1207>
35. Houdini, SideFX. Company Website: <https://www.sidefx.com/products/houdini>
36. For an example of cutting edge procedural generation of landscapes, see: "Procedural World Generation of Ubisoft's Far Cry 5 | Etienne Carrier | Houdini HIVE Utrecht," <https://vimeo.com/273986776>.
37. Masters, K., Young Oh, E., Cox, J., Simmons, B., Lintott, C., Graham, G., Greenhill, A., Holmes, K. (2016) Science Learning via Participation in Online Citizen Science. *Journal of Science Communication* 15(03) (2016) A07
38. Cisco Visual Networking Index (2017). Forecast and methodology 2016-2021. Accessed Feb 16, 2019. <https://www.reinvention.be/webhdfs/v1/docs/complete-white-paper-c11-481360.pdf>
39. *ibid.*
40. Newzoo (2019). Global Games Market Report, January 2019. www.newzoo.com
41. World Economic Forum (2019). A New Circular Vision for Electronics: Time for a Global Reboot. Accessed Feb 12, 2019.
42. Consumer Technology Association. (2014). CE Product Life Cycle. Washington DC: Consumer Electronics Association.
43. United Nations University, E-waste Rises 8% by Weight in 2 Years as Incomes Rise, [Press release], 14 December 2017, www.unu.edu/media-relations/releases/ewaste-rises-8-percent-by-weight-in-2-years.html
44. World Economic Forum (2019). A New Circular Vision for Electronics: Time for a Global Reboot. Accessed Feb 12, 2019
45. Nintendo BuyBack Program. <https://www.nintendo.com/consumer/recycle.jsp>
46. <https://www.forbes.com/sites/lamsharon/2017/11/23/global-e-waste-to-hit-49-8m-tons-by-2018-heres-what-japan-is-doing-to-combat-it/#375f411435ca>
47. World Economic Forum (2019). A New Circular Vision for Electronics: Time for a Global Reboot. Accessed Feb 12, 2019.
48. Baldé, C. P. et al., The Global E-waste Monitor 2017, UNU, ITU, ISWA, 2017
49. Ars Technica (2015). How "standby" modes on game consoles suck up energy. Accessed Feb 15, 2019. <https://arstechnica.com/gaming/2015/03/how-standby-modes-on-game-consoles-suck-up-energy/>
50. Ars Technica (2015). How "standby" modes on game consoles suck up energy. Accessed Feb 15, 2019. <https://arstechnica.com/gaming/2015/03/how-standby-modes-on-game-consoles-suck-up-energy/>

How will YOU 'level up' for the planet?

Ahead of the UN Climate Action Summit, the world's leading game companies have come together to declare their substantive, ambitious, and new commitments as the Playing For The Planet Alliance. We feature here a brief sampling from company commitment letters that document the scale and diversity of change underway. So inspired, we invite you to join the P4P Alliance in your own actions, company, online, and at a forthcoming game event near you. Together, we Play For The Planet.



We are offsetting our office travel, data centers and gamers' footprints



We are funding offsets to prevent deforestation and reforest degraded landscapes



We have a solar powered studio



We are featuring our high-profile gamers who care about this issue



We create new character animations to promote our climate action commitments



We estimate our commitments to energy efficiency in our game console will result in several million tonnes of avoided carbon emissions by 2030



We commit to footprinting all our gaming services and reporting on energy efficiency measures



We will offer game creation challenges on environment themes



We source from eco-certified factories



We optimize energy consumption and annually raise the percentage of renewables



We will plant a new tree for every new subscription



We have an active investment philosophy for SDG goals



We are working with UN Environment, industry and climate experts on a reference/resource pack for game developers



We calculate the lifecycle emissions associated with our product, including game play



We are sending our consumers new updates on equipment settings and energy efficiency



We have created an in-game challenge that gamers plant trees, rather than slay them



LEVEL 1



LEVEL UP!
BRONZE



LEVEL UP!
SILVER



LEVEL UP!
GOLD

How can the fastest growing media platform in the world be harnessed to deliver on the Sustainable Development Goals and the urgent global needs they represent? We've summarized recent relevant developments in the video games sector, perspectives from over 50 thought leaders from the industry, and extracted seven recommendations to provoke new thinking, new collaborations, new games and real-world impact. This assessment presents a vision of how the video game industry, gamers, parents, policymakers and UN Environment can together

'Play for the Planet'.

<https://playing4theplanet.org>

