DELL’s Pathway to Net-Zero Emissions

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Executive Summary

The Titans Consulting Company has come up with a training course that focuses on education, evaluation and reward. ‘DELL’s Pathway to Net-Zero Emissions’ is a training course designed around carbon neutralisation strategies and has been specifically tailored towards DELL employees.

In our role as consultants, our goal is to inform employees on the specificities of carbon neutralisation. At the end of the training course, all participants are followed up with a bench-marked quiz where they must achieve 80% or above to move to the next stage. Thereafter, a micro-badge is awarded that allows participants to apply for one of the challenge strategies set to combat climate change.

The fight against climate change is not eliminated by a 30-minute video and challenge activity. In an effort to reduce complacency, our solution also utilises DELL’s desktop screensavers and wallpapers to display updated infographics on carbon neutralisation strategies.

We know our solution is effective and hope to partner with you in your road towards your 2030 Moonshot and 2050 Net-Zero goals.

1.0 Introduction

Carbon emissions have accelerated climate change. In this report, Titans Consulting Company has designed a training course that raises awareness amongst DELL employees. This initiative has been taken up in an attempt to start change from within the company by educating employees on carbon neutralisation strategies. This course aims to inform and further challenge its employees to take strides in regards to their work and personal life to reduce their carbon emissions with the aid of technology. In this report, we provide a detailed summary of climate change; DELL's 2030 Moonshot and 2050 Net-Zero goals; carbon neutralisation and combative strategies to achieve neutralisation.

2.0 Training Plan Overview

- The proposed training course will educate DELL employees about the different carbon neutralisation strategies that can be adopted as a part of DELL's 2030 Moonshot and 2050 Net-Zero goals.
- This training course will be 30-minutes long and will be delivered face-to-face via Zoom.
- These Zoom sessions will be recorded and uploaded to SABA, allowing for DELL employees around the world to have access to this training.
- For partners/suppliers, the training video will be placed on a common SharePoint or sent via a password protected Zoom link.
- Those employees completing the training course online must do so within a specified number of days (for example 5 working days).
- For those employees completing the training face-to-face we have created a challenge that will test the practical aspects of the knowledge that they have gained.
- After successful completion of the aforementioned activities, employees will be sent a link to download their LinkedIn badge and completion certificate.

2.1 Learning Objectives

1.1 To create a fun and interactive training course that encourages active participation from DELL employees.

1.2 To bring awareness to DELL's 2030 Moonshot and 2050 Net-Zero goals.

1.3 To educate DELL employees on climate change; carbon footprints; carbon neutralisation strategies and how technology can aid in the implementation of these strategies.

1.4 To provide DELL employees with a challenge that will test their practical skills and knowledge on carbon neutralisation strategies.

3.0 Training Plan Content and Structure

Our training plan will be structured in the following format.

3.1 Training Introduction/Thought Starter on Climate Change

This training course has been designed to be fun and interactive with active participation from DELL employees. To start, employees will be shown images of the effects of climate change and will be asked questions like:

- What feelings do these images evoke inside you?
- How do your day-to-day activities contribute to this?
- How does DELL contribute towards this?

These questions will serve as a warm-up to make the employees start thinking while simultaneously providing them with a look into what the rest of the training will entail.

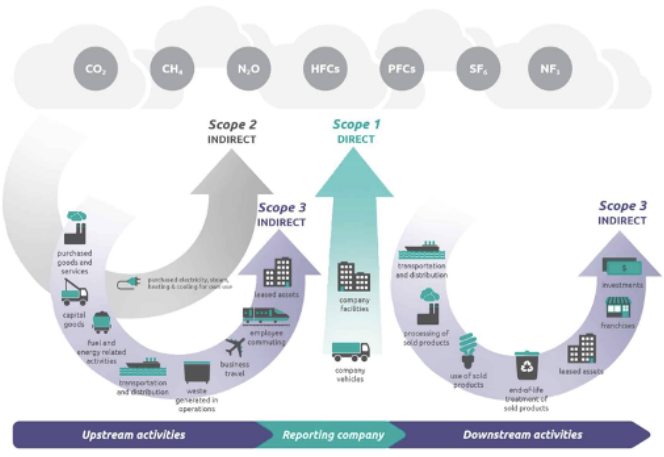
3.2 Agenda

- What is a Carbon Footprint and What Activities Contribute to it?
- How do Employees Contribute to DELL's Carbon Footprint?
- DELL's 2030 Moonshot Goals and 2050 Net-Zero Goals
- What is Carbon Neutralisation?
- Strategies for Carbon Neutralisation
- The Application of Technologies to Carbon Neutralisation Strategies
- How Do You as a DELL Employee Fit Into All This?
- Conclusion/Evaluation/Certification

3.3 What is a Carbon Footprint and What Activities Contribute to it?

To solidify the thought starter on climate change, this section will focus on carbon footprints. A carbon footprint is all of the greenhouse gas emissions caused by people, businesses, events, etc. (Carbon Trust 2009).

- Scope 1 refers to carbon emissions that are released into the atmosphere as a direct result of the activities of a particular business or organisation (Bernoville 2020).
- Scope 2 are the indirect emissions that are caused by generating purchased energy (Bernoville 2020). This could include electricity and heating (Bernoville 2020).



- Scope 3 are all of the indirect carbon emissions, not included in Scope 2, that are linked to the operations of a company (Bernoville 2020).

3.4 How do Employees Contribute to DELL's Carbon Footprint?

Many of the tasks you perform as a DELL employee contributes to the carbon footprint of the organisation. Apart from the business-centric activities (e.g. supply chain, sales and logistics), there are a myriad of activities that contribute to DELL's carbon footprint. These include your office commute**, t**he copy machine**, t**he lights and air conditioning in your office, etc. (Albeck-Ripka n.d.). Everything you do has an impact, and thus it is important to remain vigilant about how your actions impact the environment.

3.5 DELL's 2030 Moonshot Goals and 2050 Net-Zero Goals

Dell Technologies has committed to reach net-zero GHG emissions across Scopes 1, 2 and 3 by 2050 (Dell Technologies 2021)

The 2030 Moonshot Goals are:

- Advancing Sustainability
- Cultivating Inclusion
- Transforming Lives
- Upholding Ethics and Privacy

Each of these goals has sub-goals. Under the advancing sustainability Moonshot goal, Dell has a goal of 100% usage of recycled and re-used materials in all Dell products. This will significantly reduce Dell's carbon footprint and end Dell's reliance on extracting resources and materials to create their products. The other goals aim to make important social and cultural contributions, including making Dell a culturally and ethnically diverse organisation. They will also increase the roles and responsibilities of women and Indigenous peoples.

The link, https://corporate.delltechnologies.com/en-us/social-impact/reporting/2030-goals.htm#video-overlay=6261423706001, provides a detailed look at the above goals and will be beneficial if included in this training course.

3.6 What is Carbon Neutralisation?

Carbon neutralisation is a strategy aimed at removing carbon dioxide from the atmosphere and storing it in natural carbon sinks (e.g. coastal, terrestrial, ocean and geological)

(European Parliament 2021). Climate modelling by the IPCC (2018) shows most future scenarios rely on carbon neutralisation to keep global warming at 2˚C or below.

Carbon neutralisation strategies come in three forms:

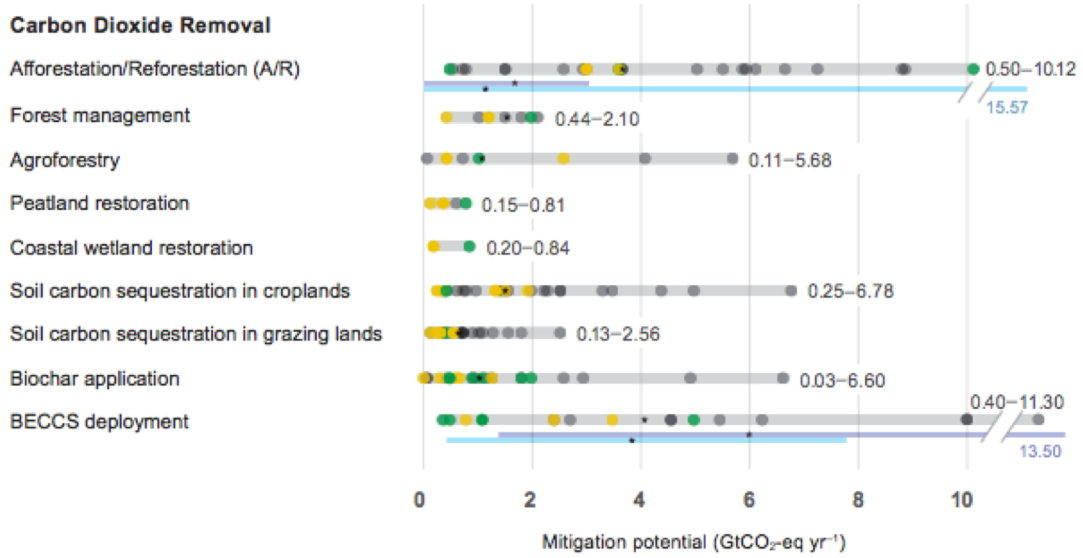
- Nature-based
- Carbon Capture and Storage
- Novel Opportunities

3.7 Strategies for Carbon Neutralisation

Nature-based Solutions

Nature based solutions refer to the use of natural systems to capture and store carbon (The Nature Conservatory n.d.). When well designed, with a focus on biodiversity and all stakeholders, they can deliver multiple benefits including climate change adaptation, biodiversity conservation and sustainable development (Seddon et al. 2020).

Figure X shows potential nature based solutions and their mitigation potential (IPCC 2018).



Afforestation/reforestation:

Photosynthetic carbon capture by trees is one of the most effective ways of removing CO2 from the atmosphere (Bastin et al. 2018). An estimated 1 billion hectare increase in forest cover could effectively limit global warming to 1.5˚C by 2050 (Bastin et al. 2018).

Soil carbon sequestration.

Soil carbon sequestration involves the removal of carbon from the atmosphere and storage in the soil (Fuss et al. 2018). It has key benefits, including greater food security as increased soil carbon can increase land productivity and crop yields (IPCC 2018).

Carbon Capture and Storage

Carbon capture and storage (CCS) refers to the capture of carbon dioxide and its permanent storage in geological formations (Global CCS Institute 2019).

There are two main forms of CCS:

Carbon capture from large point sources

To avoid release into the atmosphere, carbon can be captured from large point sources, such as a power station, and stored underground in geological formations (Gibbins & Chalmers 2008).

An effective form is bioenergy with carbon capture and storage (BECCS) where carbon dioxide released when biomass is burnt to create energy is captured and stored (Budinis 2021). This delivers negative emissions as cultivating biomass removes carbon from the atmosphere as it grows, and the carbon is then stored (Bui et al. 2021).

Direct air capture

Direct air capture is a technology that captures carbon directly from the atmosphere and stores it in geological formations or re-purposes it (Budinis 2020). There are two technologies that allow this. Solid direct capture uses filters that chemically bond with CO2 and are later heated to release CO2 for storage, whilst liquid systems thread air through chemical solutions, removing CO2 (Budinis 2020).

Novel Opportunities

Novel opportunities refer to new carbon removal technologies (reference). Two examples of this method include:

Carbon Mineralisation

Carbon mineralisation involves removing carbon dioxide from the air and storing it in solid form in carbonate minerals, such as magnesite or calcite (National Academies of Sciences, Engineering, and Medicine 2019). Once in solid form, carbon cannot escape into the atmosphere (Chiang & Pan 2017).

Bioplastics
Bioplastics refer to plastics that are created from the Earth (Project Drawdown 2021). These bioplastics are also biodegradable, meaning that once they are used they can be returned to the Earth using fewer carbon emissions (Project Drawdown 2021). These bioplastics are important for this training course as they can be used in technology (Project Drawdown 2021).

3.8 The Application of Technologies to Carbon Neutralisation Strategies

Technology has significant potential to improve carbon neutralisation strategies through disruptive innovation and optimising existing strategies (Goh 2021). Key technologies include:

Unmanned Aerial Vehicles
Unmanned aerial vehicles(UAVs) can assist in afforestation/reforestation projects. Imaging systems, such as digital cameras or Li-DAR, can be mounted on UAVs, allowing aerial mapping and monitoring (Elliott 2016). Plant recognition systems can be combined with machine learning to allow automated mapping of seed trees and smart spraying auto-weeding systems (Elliott 2016). They allow aerial seeding, able to plant 100,000 seeds each day and reduce planting costs by 85% (Falk 2019).

Artificial Intelligence
Artificial intelligence(AI) can analyse data in digital formats, including numerical databases, images and video, and perform tasks typically reliant on human intelligence (Goh 2021). It can assist in afforestation/reforestation projects by enabling precise landscape monitoring, such as flora and fauna image recognition through deep machine learning (Goh 2021). AI can also analyse big data, contributing to landscape planning for restoration (Goh 2021). AI-powered logistics planning can optimise biomass dispersal to decentralised BECCS facilities (Goh 2021).

Internet of Things
The Internet of Things (IoT) can connect mobile phones, computers, various physical, biological and chemical sensors and controllers through electromagnetic transfer (Goh 2021). It can increase efficiency and safety in forest management by enabling real-time data collection and transfer or allowing GPS-enabled machinery to assist or replace humans, such as in tree harvest (Goh 2021). IoT can facilitate informed decision making in BECCS projects by automatically tracking biomass quality parameters and sharing information across the value chain (Goh 2021).

3.9 How Do You as a DELL Employee Fit Into This?

DELL employees will have to use and create new and innovative ways to provide a range of different communities with access to technology (Dell Technologies 2021). Thus, as part of this training course, we have come up with a challenge that will test employees' knowledge, skills and understanding of DELL's 2030 Moonshot goals and the importance of carbon neutralisation. After this training, employees will choose one of three groups (depending on spots available) and be provided with a challenge prompt explaining what they will need to do. This challenge will be explained later on in the report.

3.10 Conclusion/Certification/Evaluation

At the conclusion of the course, employees will need to undertake a short quiz on the information presented in the training. This quiz will also include a short reflection survey in which employees can voice their opinion on how beneficial this course was. Once an employee has achieved 80 per cent or above in the quiz, they will receive an email (*Appendix A*) that will provide them with a link to access their LinkedIn badge (*Appendix B*). Links to further training programs that employees need to complete will also be provided in this email. The challenge, which follows the training, will allow DELL to evaluate its employees' skills and ability to adapt to challenges. Additional certifications will also be handed out after the challenge: these will be elaborated on in the next section.

4.0 The Challenge

Titans Consulting Company has proposed a challenge that will serve as a new initiative designed to support the training course. It will take place over three days and will allow employees to showcase both their commitment, as well as, their practical skills to highlight what they have learnt from the training course. This challenge is not mandatory and will primarily be made available to those in face-to-face classes as this is more feasible. The skillset of potential challenge participants will also be taken into account when it comes to who will be accepted as some challenges may require particular skills. Those chosen for the challenge will choose one of three groups, each of which will focus on one category of carbon neutralisation strategies (e.g. nature-based; carbon capture and storage; and novel opportunities). Allocation to an employees' group of choice will be dependent on a first-come, first-served basis to ensure that each group has an equal number of people. Examples for potential challenges include:

- Nature-based
    - Create a community outreach program that teaches rural communities how to use drones in afforestation projects.

- Carbon Capture and Storage
    - Design a blueprint for an AI system that optimises biomass dispersal to carbon capture and storage facilities.
- Novel Opportunities
    - Design a sales pitch to convince customers to buy laptops made out of bioplastics.

As a secondary aspect to this challenge, each team will be expected to document the innovative ways that they have reduced their carbon footprint through their challenge. This task will further integrate aspects of the training which will boost the knowledge gained through the training course.

This challenge will take place over three days. The first day will focus on the introduction to the challenge; any basic training that employees will need to complete their challenge (e.g. use of technology); and travel to the challenge destination. The second day will be focused on completing the challenge and the final day will consist of each group giving a short presentation on what they have achieved and learnt from their challenge.

All participants in the challenge will receive a certificate of participation (*Appendix C*). The group that creates the best project will receive a winner's certificate with the potential for a secondary award (at the discretion of DELL). This extra reward will create a further incentive to do well for the participants of this challenge.

5.0 Strengths and Weaknesses

The training course developed has clear strengths and weaknesses.

5.1 Potential Strengths

Structure
The training course explains carbon neutralisation strategies in a clear and easy to understand format, following the model suggested by Keeps & Stolovitch (2011). The provision of feedback allows participants to understand how they are tracking and how they can improve.
Interactive
The training course is interactive with opportunities for participation including a final assessment. The challenge maximises participation, ensuring participants are engaged.
Relevance
This training program is tailored to the skills and interests of Dell employees with a clear focus on the role of technology. The ability to choose one of three challenges allows employees to participate in the activity that they are most interested in and feel they can contribute the most to or attain the most value from. The challenge also allows direct and meaningful application of knowledge gained in the training course.
Benefits

Upon completion, participants are awarded a certificate and LinkedIn micro badge, contributing to their professional development. The challenge similarly provides an opportunity for professional and personal development. This is important as it motivates participants to engage with the material and implement it.

5.2 Potential Weaknesses

Challenge Requirements
A potential weakness is a requirement for participants to have three days off work to complete a challenge. Some of the challenges may also require off-site attendance, necessitating travel. Both create financial and feasibility challenges.
Intensity
Another potential negative is that a 30-minute training session may be insufficient to meaningfully change participant's attitudes and behaviours. This is particularly an issue as the content may not be constantly reinforced in the day-to-day actions of all DELL staff. A follow-up training session each year could, therefore, be beneficial.

6.0 Potential Budget

Training course:
The total cost of developing and implementing the training course is estimated at $3,540.00. Development is estimated to take 9 hours ($60/hour), with a total cost of $540. The wages ($60/hour) for 100 participants to complete the 30 minute course are estimated at $3,000.

TRAINING COURSE					
Project activity	**Hours**	**Number of participants**	**Rate**	**$**	**% of budget**
Planning and research	3	n.a.	$60.00	$180.00	5.08%
Visual aid development	3	n.a.	$60.00	$180.00	5.08%
Voice over recording	1	n.a.	$60.00	$60.00	1.69%
Video editing	2	n.a.	$60.00	$120.00	3.39%
Employee wages for training time	0.5	100	$60.00	$3,000.00	84.75%
Total training course	**9.5**	**100**	**$60.00**	**$3,540.00**	**100.00%**

Challenge:
The total cost for the challenge is estimated at $57,632. The majority of this expense is employee and supervisor wages for 24 hours (3x 8-hour days), at $60/hour. This totals $47,520, when travel expenses for 24 participants and three supervisors to travel 200km (to and from the challenge site), using the ATO $0.72/km method, are included. Additional expenses are for 6 hours of planning and research ($60/hour) and an additional $5,000 to purchase necessary equipment.

CHALLENGE							
Project activity	**Hours**	**Number of participants**	**Distance of travel (km) per participant**	**Cost of travel ($) (using ATO cents/km method)**	**Rate**	**$**	**% of budget**
Planning and research	6	n.a.	0	$0.00	$60.00	$360.00	0.62%
Purchase of equipment e.g. drones	0	n.a.	0	$0.00	n.a	$5,000.00	8.68%
Supervisor costs (wages + travel)	24	3	200	$432.00	$60.00	$4,752.00	8.25%
Employee costs (wages + travel)	24	30	200	$4,320.00	$60.00	$47,520.00	82.45%
Total challenge	**54**	**33**	**200**	**$4,752.00**	**$60.00**	**$57,632.00**	**100.00%**

7.0 Additional Ways to Build Awareness and Educate

There are many additional ways to build awareness and educate internal teams in addition to a training course. Three ways that will be addressed here include training modules, laptop screensavers and wallpapers, and establishing partnerships with other organisations.

Training modules are important tools that should be made available throughout the training course via SABA. These modules could be used by employees to aid their understanding of information learned during the training course. Concerning this training course, two modules will be created to further educate DELL employees. One module will focus on the importance of climate change and the necessity of reducing carbon emissions for technology companies like DELL (Motes 2021). This module will also be linked to DELL's 2030 Moonshot goals and the importance of these in achieving Net-Zero emissions by 2050 (Dell Technologies 2021). The second module will focus on carbon neutralisation strategies and how technology can be utilised in their implementation. These modules will help to cement an understanding in employees of DELL's net-zero goals and emphasise their importance in tackling climate change (Motes 2021).

Subsequently, laptop screensavers and wallpapers can also be utilised to build awareness among DELL employees. Every time employees open their laptops, they will see a wallpaper outlining the 2030 Moonshot goals. Additionally, when employees lock their laptop, screensavers with DELL's 2030 Moonshot goals will be displayed.This will help reiterate the information learned in the carbon neutralisation training and allow it to stay in the minds of DELL employees.

Finally, another way to build awareness and educate within DELL would be to establish partnerships with organisations that contribute to carbon neutralisation strategies. For example, DELL could partner with reforestation groups, like Landcare Australia, a group that has been involved in creating sustainable agricultural practices and the conservation of Australian plants since 1989 (Landcare Australia 2021). These partnerships could also be utilised as a part of the challenge, such as the application of DELL technology to carbon neutralisation projects.

8.0 Conclusion

To conclude, without this training course, DELL employees will be ineffective in reducing carbon emissions resulting in an inability for DELL to meet both their 2030 Moonshot and 2050 Net-Zero goals. However, with both the information provided in the training course, as well as, the practical skills learnt and showcased throughout the challenge, DELL employees will have a better understanding of how carbon neutralisation strategies can meet these goals. In the words of Anne-Marie Bonneau (as cited in Payne 2021), “we don’t need a handful of people doing zero waste perfectly. We need millions doing it imperfectly”. The active participation and cooperation between employees in the training course and challenge can be seen as a way of contributing to those millions of people doing zero waste imperfectly, or in this case, perfectly. Therefore, DELL should implement this training course within their company as a way of boosting their potential to meet both their 2030 Moonshot and 2050 Net-Zero goals.

9.0 Glossary of Terms

Afforestation - The conversion of land that has historically (for at least 50 years) not contained forests to forest (IPCC 2019).
Artificial Intelligence (AI) - a device that can analyse digital data but also perform tasks that were originally intended for humans (Goh, Ahl and Woo 2021).
Big Data - large databases that are grown from various input devices (Goh, Ahl and Woo 2021).
Bioenergy with Carbon Capture and Storage (BECCS) - The process of capturing carbon emissions from energy production using biomass, prior to their release into the atmosphere, and storing the captured carbon in geological formations or long-lived products (Budinis 2021).
Biomass - organic material that is recently dead or living (IPCC 2018).
Bioplastics - plastics that are created from the Earth and are biodegradable (Project Drawdown 2021).
Carbon Capture and Storage - the capture of carbon from the atmosphere and its storage in geological formations (IPCC 2018).
Carbon Emissions - refers to the release of caborn, and other greenhouse gases, into the Earth's atmosphere (ecolife dictionary n.d.).
Carbon Footprint - all of the greenhouse gas emissions caused by people, businesses, events, etc. (Carbon Trust 2009).
Carbon Mineralisation - involves removing carbon dioxide from the air and storing it in solid form in carbonate minerals, such as magnesite or calcite (National Academies of Sciences, Engineering, and Medicine 2019)
Carbon Neutralisation - a strategy aimed at removing carbon dioxide from the Earth's atmosphere and storing it in natural carbon sinks (e.g. coastal, terrestrial, ocean and geological) (European Parliament 2021).
Carbon Sinks - "anything that absorbs more carbon from the atmosphere than it releases - e.g. plants, the ocean and soil" (ClientEarth Communications 2020).
Climate Change - a change of climate attributed to human activity indirectly or directly which alters the global atmospheric composition and is additional to natural climate variability (IPCC 2018)
Community Outreach Program - a program that connects a company's ideas / practices to a community (Grace College 2021).
Greenhouse Gas Emissions - the anthropogenic release of gases, such as carbon dioxide, that become trapped in our atmosphere and cause it to heat up (EPA 2021).
Internet of Things (IoT) - the connection of various devices through the internet that allows them to send and receive data from each other (Goh, Ahl and Woo 2021).
Li-DAR - Light Detection and Ranging (Li-DAR) is a system that can be used to analyse the surface of the Earth remotely (National Ocean Service n.d.).
Liquid Systems Extracts - a strategy that extracts carbon from the air by treating it through liquid filters that separate and store the carbon dioxide (Budinis 2020).
Nature-based Solutions - Nature based solutions refer to the use of natural systems to capture and store carbon (The Nature Conservatory n.d.).
Net-Zero Emissions - creating a balance between the amount of greenhouse gas emissions being produced and taken from the atmosphere (Climate Council n.d.).

Novel Opportunities - new carbon removal technologies (reference?).
Reforestation - The conversion of land that has previously contained forests, but has subsequently been converted to another other land use, to forest (IPCC 2019).
Solid Carbon Sequestration - the removal of carbon from the atmosphere and storage in the soil (Fuss et al. 2018).
Solid Direct Capture - a method of capturing carbon dioxide through filters coated in chemicals that have bonded with carbon (Budinis 2020).
Training Course - a course that provides individuals with training in a certain area (Collins 2021).
Training Modules - a structured section of a training course (McGarry 2019).
Unmanned Aerial Vehicles (UAVs) - a form of aircrafts that do not need a pilot onboard to be able to fly (Gopal, Narayanan and Ibe 2015).

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All images and videos from pexels

11.0 Appendices

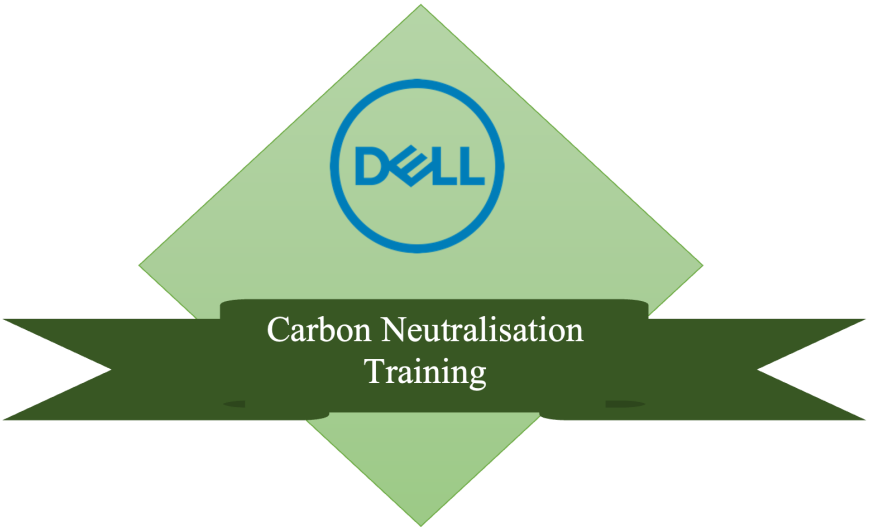
Appendix A: Automated Email that Participants Receive after the Training Course
Dear Participant,

Congratulations on completing your carbon neutralisation training! Please find attached a link to access your LinkedIn Badge and any further training that you need to complete. You will be able to choose your group for the challenge shortly and will receive the prompt for the associated challenge once your choice is confirmed. We wish you all the best for your challenge!

Kind regards,
Dell Technologies Trainer

Further Training Links:

Appendix B: LinkedIn Badge



Appendix C: Challenge Participation Certificate

Appendix D: Possible screensaver backgrounds

Appendix E: Possible desktop backgrounds

Appendix F: Link to potential slides to accompany training course on carbon neutralisation strategies and the application of technology

https://www.canva.com/design/DAEj9L2hSq0/fwFZDH4utwaFfuu7UinToQ/view?utm_content=DAEj9L2hSq0&utm_campaign=designshare&utm_medium=link&utm_source=sharebutton

Appendix G: Links to further training resources

Climate change and why urgent action is required

- https://www.climatecouncil.org.au/wp-content/uploads/2021/04/aim-high-go-fast-why-emissions-must-plummet-climate-council-report-210421.pdf
- https://sciencebasedtargets.org/resources/legacy/2019/12/SBTi-Progress-Report-2019-FINAL-v1.2.pdf

Carbon neutralisation strategies

https://www.drawdown.org/solutions

Nature based solutions:

- http://naturalclimatesolutions.org/
- https://files.wri.org/d8/s3fs-public/consideration-nature-based-solutions-offsets-corporate-climate-change-mitigation-strategies.pdf
- https://files.wri.org/d8/s3fs-public/roots-of-prosperity_0.pdf
- https://exponentialroadmap.org/wp-content/uploads/2020/03/ExponentialRoadmap_1.5.1_216x279_08_AW_Download_Singles_Small.pdf

Carbon capture and storage:

- https://www.iea.org/reports/direct-air-capture
- https://www.globalccsinstitute.com/

Novel opportunities:

- https://www.drawdown.org/solutions/bioplastics

Application of technology:

- https://airseedtech.com/

DELL's 2030 Moonshot Goals

- https://corporate.delltechnologies.com/en-us/social-impact/reporting/2030-goals.htm#video-overlay=6261423706001