HOW CAN IMPLEMENTING A VDI SOLUTION HELP REDUCE YOUR **COMPANY'S CARBON FOOTPRINT?**

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CARBON FOOTPRINT ANALYSIS FOR VDI SOLUTION

With green issues starting to play a major art in how companies do business, people are increasingly looking at how their business impacts the environment.

One way of reducing their environmental impact is by reducing the amount of power they use. This has a direct relationship to their carbon footprint.

Desktops are seen as increasingly contributing to carbon emissions, through inefficient power consumption, heat generation and through their cooling requirements.

In this document we aim to show how implementing VDI (Virtual Desktop Infrastructure) for a typical 1000 user company, can greatly reduce a company's carbon footprint compared to the alternative of normal PCs on desks.

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INTRODUCTION

On average, a desktop's lifespan is around three to four years. After this timeframe they are seen as unusable or inefficient and need to be replaced.

Due to user demands desktops' need to be available at all times. A single desktop per user consumes significant power; this can drastically affect the overall IT budget and future cost-control strategies.

Many organisations are moving to Virtualisation as this is a preferred solution for going 'green'. It also helps them reduce operational expenditure and capital expenditure.

With Virtualisation the total number of physical servers running in the datacentre can be reduced by consolidating multiple virtual servers into one physical server.

Desktop virtualisation can be utilised to integrate different virtualisation technology
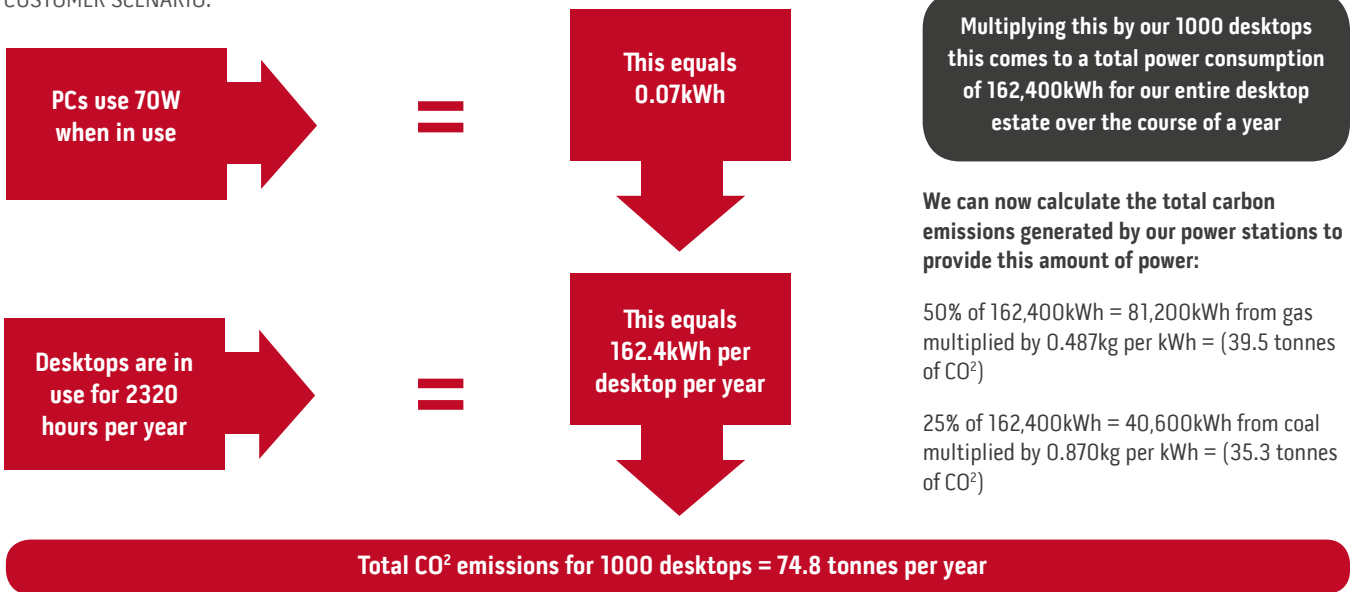
components into an efficient VDI. VDI is a computing model that adds a virtualisation layer between the actual server and desktop computers

VDI solutions can bring a wide range of benefits and create new opportunities and contribute to an overall reduction in energy costs and carbon emissions.
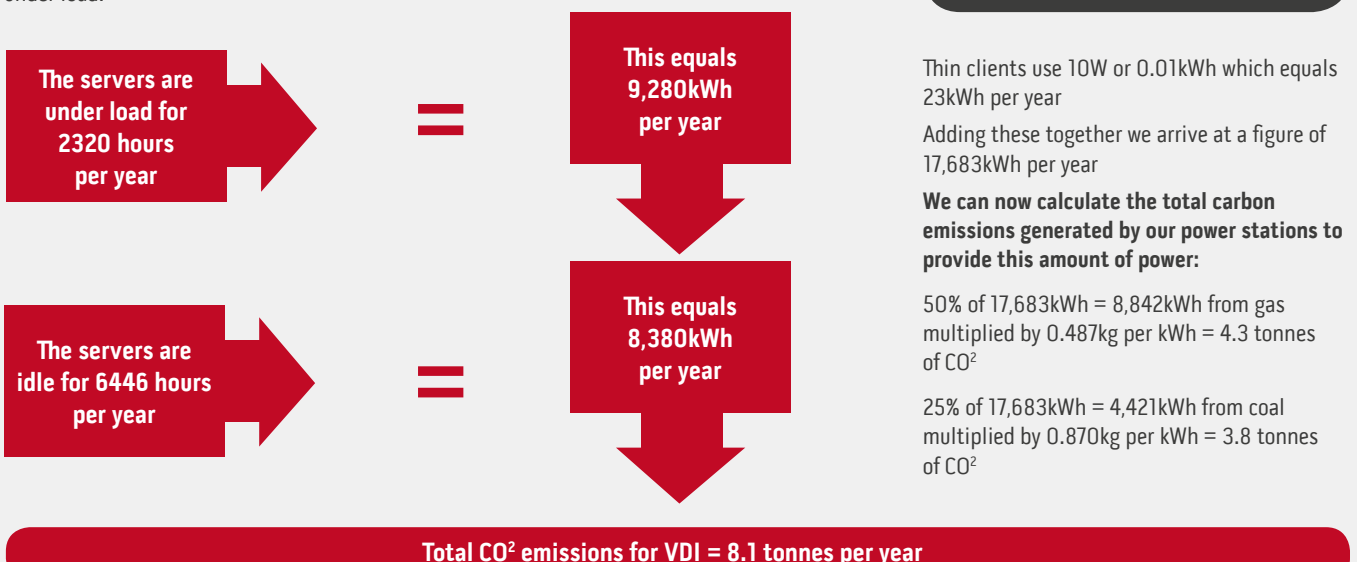
TRADITIONAL DESKTOPS

CUSTOMER SCENARIO:

PCs use 70W when in use

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This equals 0.07kWh

Multiplying this by our 1000 desktops this comes to a total power consumption of 162,400kWh for our entire desktop estate over the course of a year

We can now calculate the total carbon emissions generated by our power stations to provide this amount of power:

50% of 162,400kWh = 81,200kWh from gas multiplied by 0.487kg per kWh = (39.5 tonnes of CO_2)

25% of 162,400kWh = 40,600kWh from coal multiplied by 0.870kg per kWh = (35.3 tonnes of CO_2)

Desktops are in use for 2320 hours per year

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This equals 162.4kWh per desktop per year

Total CO_2 emissions for 1000 desktops = 74.8 tonnes per year

VDI ENVIRONMENT

CUSTOMER SCENARIO:

Typical 1000 user server environment draws 3978W or (rounded up) 4kWh of electricity when under load.

This gives total power consumption for servers per year of 17,660kWh

The servers are under load for 2320 hours per year

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This equals 9,280kWh per year

Thin clients use 10W or 0.01kWh which equals 23kWh per year

Adding these together we arrive at a figure of 17,683kWh per year

We can now calculate the total carbon emissions generated by our power stations to provide this amount of power:

50% of 17,683kWh = 8,842kWh from gas multiplied by 0.487kg per kWh = 4.3 tonnes of CO_2

25% of 17,683kWh = 4,421kWh from coal multiplied by 0.870kg per kWh = 3.8 tonnes of CO_2

The servers are idle for 6446 hours per year

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This equals 8,380kWh per year

Total CO_2 emissions for VDI = 8.1 tonnes per year

CONCLUSION

We can see from the calculations that if we deploy VDI for our 1000 desktop users, we can potentially save 66.7 tonnes of CO_2 emissions every year.

SO, HOW MUCH IS 66.7 TONNES OF CARBON?

If we take an average business vehicle such as a BMW 520d that emits 124g/km of CO_2 (Source: BMW), then our 66.7 tonnes saving is equivalent to **538,000km travelled**. Or, if we take an average use of 20,000km/year for a typical car user, it's equivalent to **removing nearly 27 vehicles from our roads**.

The carbon emissions savings of a VDI deployment can be significant and have the potential to massively reduce the environmental impact of your business.

With the potential for carbon taxing and trading coming in the future, a VDI deployment could go a long way towards making your business greener and more efficient.

Contact us to find out how our VDI solutions helped some of our clients.

REFERENCES

ASSUMPTIONS

Each desktop in our hypothetical scenario is a typical desktop PC from the likes of HP or Dell. It will be used for normal office tasks, therefore not drawing a huge amount of power for 3D rendering or other tasks that are extremely CPU intensive. A good average for this kind of use case is 70 Watts per desktop. (Source: DSSW)

We will assume that the desktop PC is only powered on between the hours of 8am and 6pm, 5 days per week. Deducting national holidays and a typical holiday entitlement for the PC user of 21 days per year, we arrive at a total number of active hours per year of 2320 hours.

Our PCs will use the same monitors as our potential VDI solution and so can be excluded from the calculations as they are a constant.

Our power will come from typical sources in the UK with 75% of it coming from non-renewable sources. This breaks down to 50% from gas and 25% from coal. The remaining 25% will come from nuclear or renewable sources. (Source: Energy UK)

- Gas-fired power stations emit 487g of CO_2 per kWh generated. (Source: EDF)
- Coal-fired power stations emit 870g of CO_2 per kWh generated. (Source: EDF)
- Our VDI environment will use HP C7000 Bladesystem servers
- Our VDI environment will use Citrix VDI in a box and will achieve a consolidation ratio of 100 desktops per server

- We will have an N+1 configuration of servers to allow for failures.

Our server infrastructure will be drawing 3978 Watts in use and 1306 Watts when idle. (Source: HP Power Advisor)

Our server will operate 24/7/365 but will be idle outside of business hours.

Our VDI clients will be HP t520 thin clients which use 8 Watts. (Source: HP)

We will ignore the potential savings from air-conditioning costs although these can also be significant.

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