



**New Data Center concept: one of the largest in Europe,
one of the world's most sustainable**

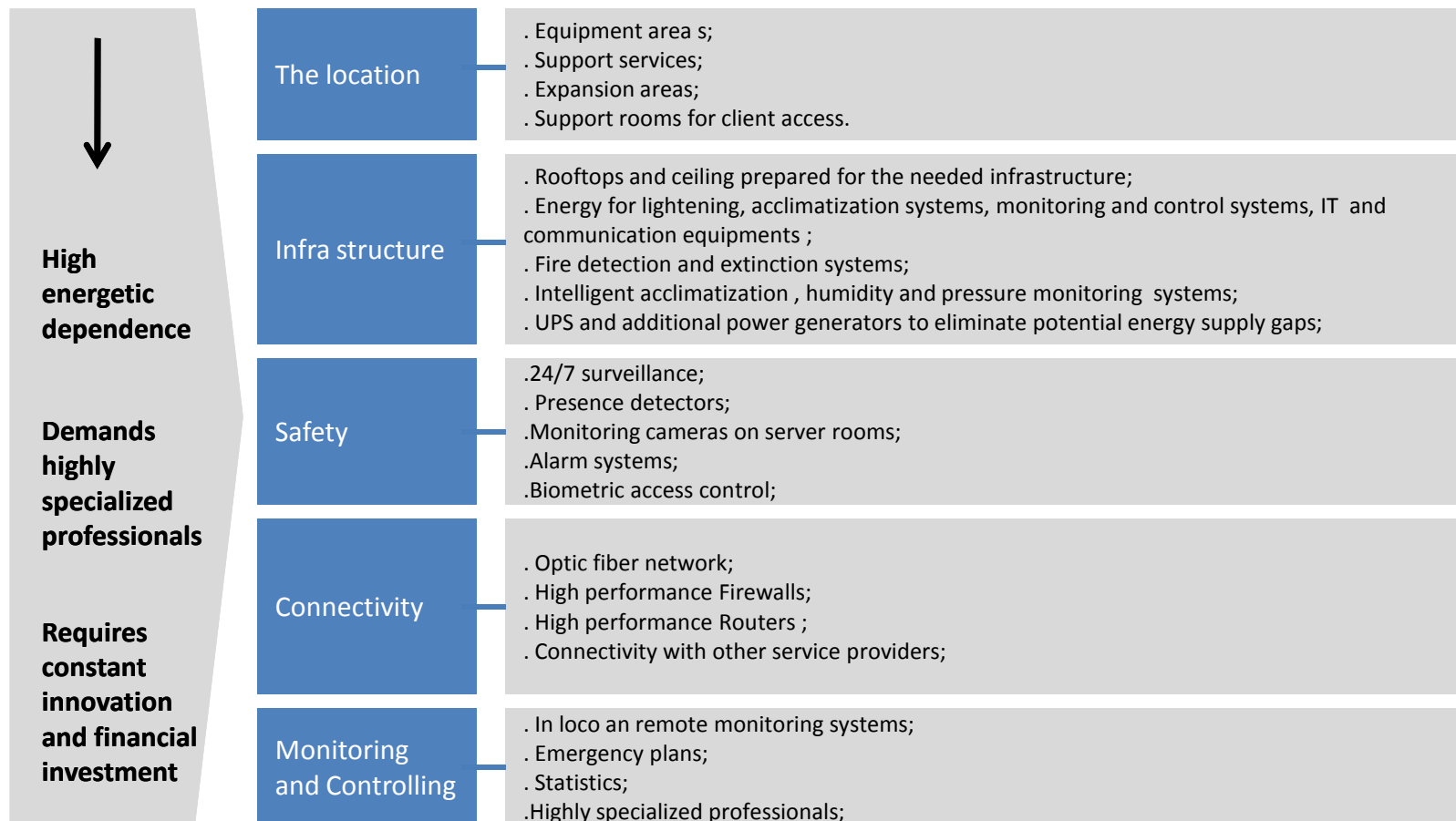


New Data Center concept

Framework

Information and data transmitted has become bigger and storage, management and transmission needs are very demanding, requiring greater processing capacity and more sophisticated transmission networks.

Data Centers are the spots where data processing and storage equipments are gathered. These locations and equipments require many resources so that people and companies are able to communicate, access, transmit and store information.





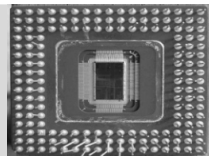
New Data Center concept

Framework

Deep changes in the way we live

The first awakening to mobile communications and the Internet have about twenty years. Currently, access to communication and information is done anywhere, at any time and from multiple devices.

Twenty years ago



computers had 25 MHz processors...



pager was the only affordable way of mobile contact...



a hard drive with 1GB weighed 38 kg ...



written communication in real time was made by fax...



information access was based in physical supports

Today.....



...computers have 3.6 GHz processors



... we communicate face-to-face with people across the world



...Smartphone's have capacities greater than 32 GB



... we communicate in real time by chat, e-mail, social media and SMS/ MMS



WIKIPEDIA

... information access is done anytime and everywhere



New Data Center concept

Framework of the action

New challenges demand new answers

Using the full potential of ICT have a negative impact on economic and environmental sustainability of the company's traditional Data Centers and services provided. PT's answer to this issue involves its ability to innovate (which includes its partners innovations too), at thechnological, environmental, oragnizational and social levels.

1

Cutting edge technology at european level

- . Triple the capacity of information storage;
- . Global investment of about 2.5 corresponding to the capacity built within the last 3 years worldwide;

2

Partnerships to assure next generation services

- . Partnerships with leading companies worldwide to guarantee the supply of secure and remote software and edge-services to business customers;
- . Platform support for developing services and applications;
- . Assure leadership in innovation;

3

Sustainability and energy efficiency

- . Energy efficiency procedures and systems to ensure a competitive and environmentally sustainable operation;
- . Construction of a wind energy park in order to maximize the use of energy from renewable sources and ensure lower levels of carbon emissions;

4

Modular construction and impact on local economy

- . Modular construction (by specific stages) giving the opportunity to increase its capacity in the future;
- . Direct impact on the local economy by promoting employability and giving priority to materials and services produced in the region;




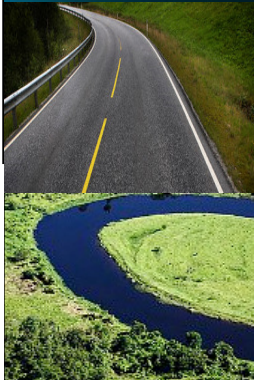


New Data Center concept

Risk Assessment

Identify the most adequate location

Selecting the location of the new Data Center required a deep risk analysis to ensure the minimization of risks and impacts, leveraging the storage, processing and transmission capacities.

	Environmental risks to avoid	<ul style="list-style-type: none">. Flooding risk;. Landslides risk;. Seismic risk;. Absence of pollution and fire hazards;
 	Access to basic infrastructure in order to reduce environmental footprint and additional costs	<p>Energy</p> <ul style="list-style-type: none">. Power availability (40MW);. Energy supply in high voltage level (60kV);. Availability of renewable energy resources (e.g. wind); <p>Communications</p> <ul style="list-style-type: none">. Connection to PT fiber backbone network;. Reliability and stability of the network;
	Environmental impact and investment sustainability	<ul style="list-style-type: none">. Proximity and availability of main roads access;. Proximity and availability of train stations;. Sewerage network and other support services;. Access to cold sources for cooling processes;. Average temperature of local weather for free cooling systems;. Administrative and fiscal costs;



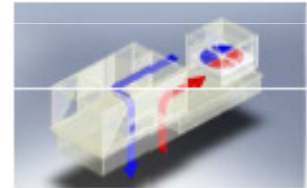
New Data Center concept

Energy efficiency of the new data centre

Renewable energy use, environmental friendly and intelligent temperature distribution HVAC systems, high energetic efficient lightening and monitoring systems were the basis thought for the construction of the biggest European environmental sustainable Data Center, that is being built by PT.



Renewable energy use	<ul style="list-style-type: none"> . Wind energy park to be built next to this data centre; . The data centre coverage will be done with solar panels;
Free cooling system	<ul style="list-style-type: none"> . Ventilation system that takes advantage of the low outside temperature; . Intelligent management and control of acclimatization system;
Lighting	<ul style="list-style-type: none"> . LED lighting system; . Intelligent monitoring system;
Control and monitoring	<ul style="list-style-type: none"> . Advanced measuring equipment of energy consumption: efficiency enabler according to the needs of energy supply of equipment and its air conditioning needs;

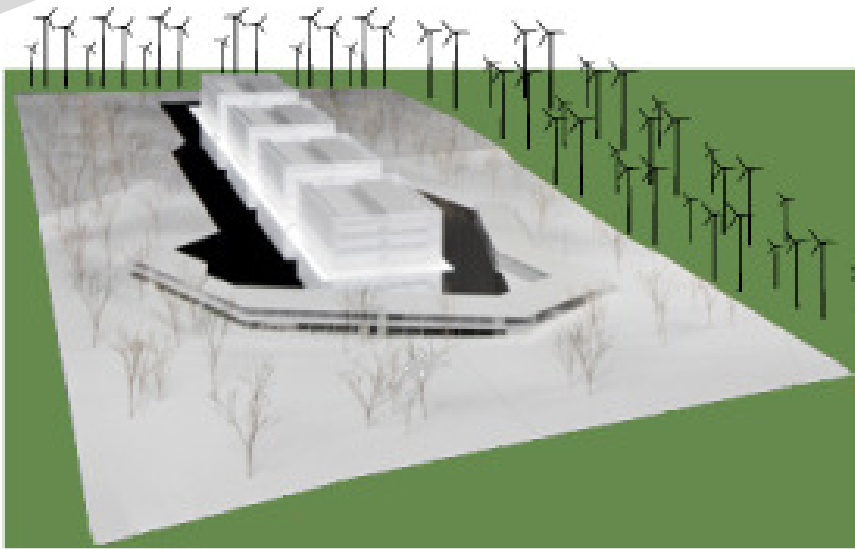




New Data Center concept

Project and location in Covilhã, Portugal
Look & feel

Under construction in
Covilhã

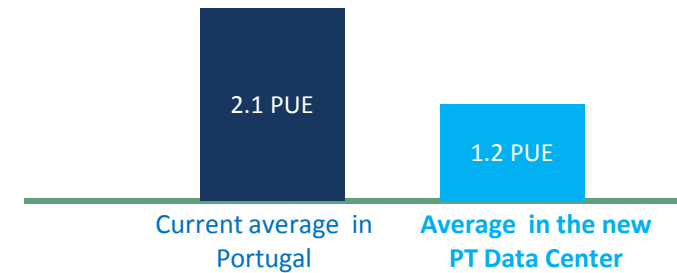


Efficient use of IT

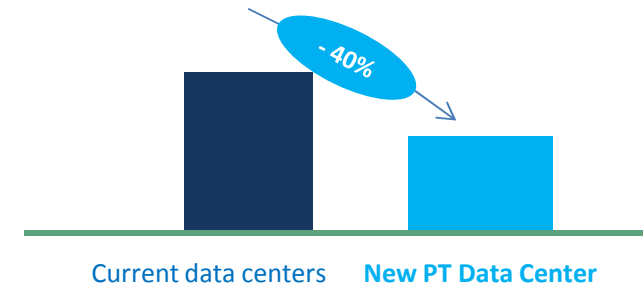
- Cloud Computing
- Virtualization

- ✓ Installation of 50,000 servers, equivalent to 30 Pbytes, or 50 million movies, photo 14 billion or 2 billion songs;
- ✓ New capacities to export storage, services based on IT solutions;
- ✓ Ability to reduce the environmental footprint of customers and to leverage their business (less space for equipment, less maintenance costs, less equipment costs,...)

Energy Efficiency – PUE (Power Usage Effectiveness)



Decrease of Energy Consumption

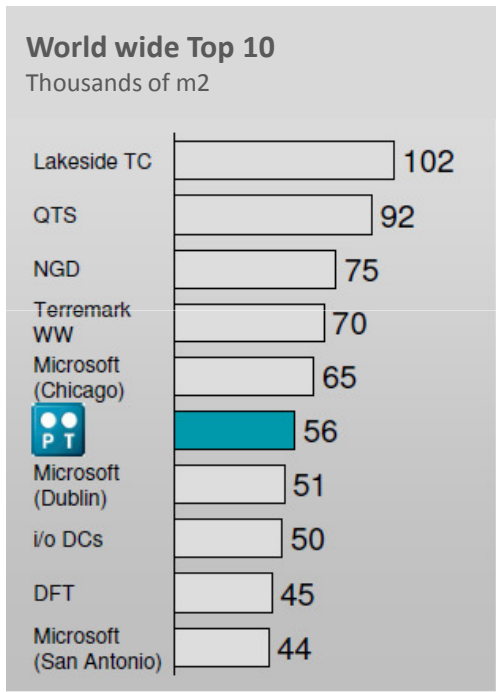




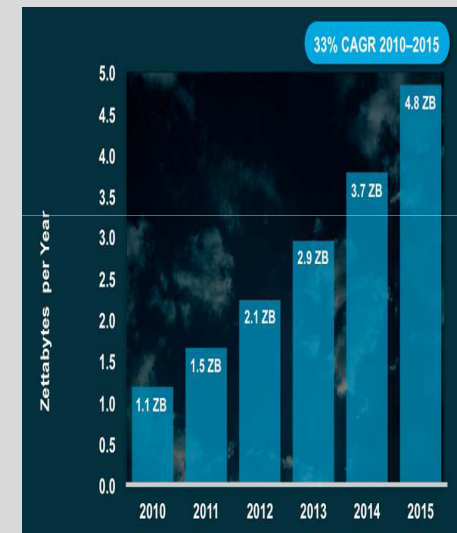
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International dimension and export capacity
 Comparing with others

World wide Data Centre Leveraging global international presence of PT



Prospects for internet traffic growth in the coming years.



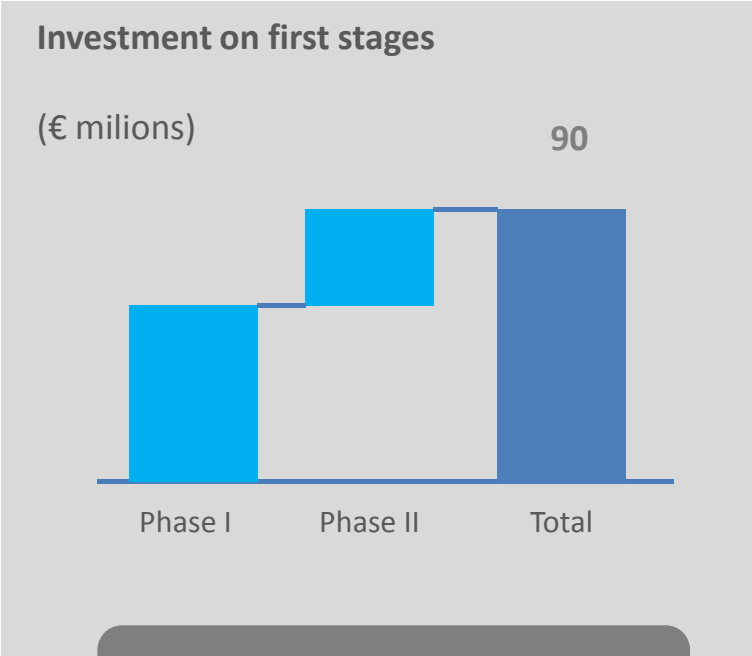
Source: In Cisco® Global Cloud Index, 2011



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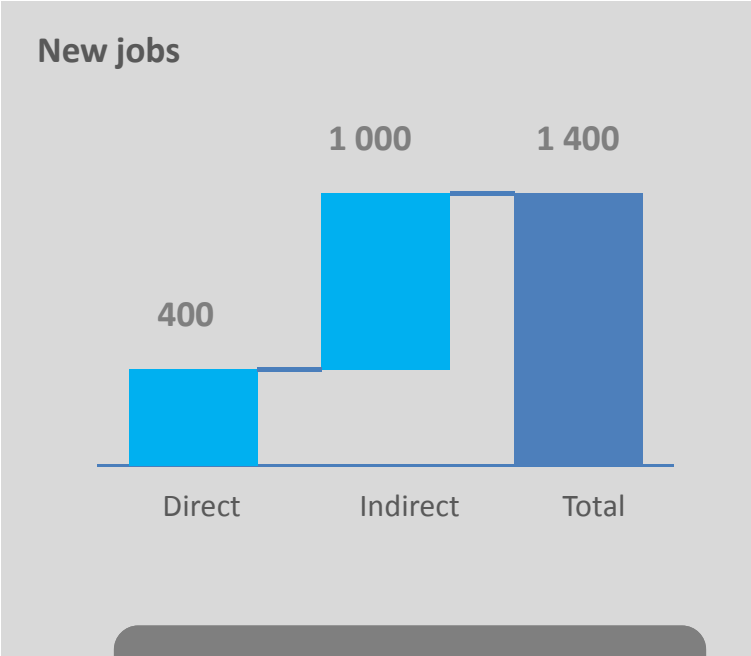
Investment phase I and II of 90 €uro million
Build the future today

Expressive Investment....



Phase I already under construction.
To work from the end of 2012

...with job creation



Recruitment has already started



New Data Center concept

Skills and strategy to build the new Data Center

Build the future today

Investment strategy and unique position to promote “cloud” services

“Cloud” services requirements :

Transmission and high capacity access

PT skills:

- . Very high speed performance on transportation network, with total capacity of 40 Tbps;
- . Leadership in the roll out of “Fiber To The Home” with 1.6 million homes passed and the focus on new LTE (Long Term Evolution), which is a network technology for wireless communication of high-speed data;



Storage and processing capacities

- . Largest national data centers network;
- . Construction of one of the largest and sustainable data centers in Europe;



Technical expertise

- . Leadership in IT/IS services;
- . More than 2 000 engineers and specialists highly qualified;





New Data Center concept

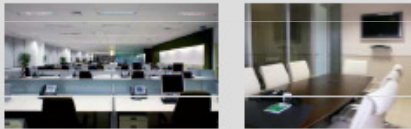
Market levers

Look & feel

External users

Internal users

“Taylor made” management solutions and IT services



Advanced technological solutions and environmentally friendly

New communication and multimedia services



Development of new service platforms

Internal IT systems



Maximizing the efficiency of internal systems

Positive effects on service delivery to customers



Economic
Environment
Social



New Data Center concept

Impacts assessment

Direct and Indirect impacts



Direct impacts

Environmental

- 75% of the Data Center energy supply will come from renewable sources ;
- It will have the state of the art of cooling and heating equipment (e.g..chillers with heat recovery) controlled by building management systems;
- The Data Center will use Low-Emitting Materials (e.g. Paints and Coatings);
- The building will provide individual lighting controls for 90% (minimum) of the building occupants;
- It will save 144,000 tons of CO2;

Social

- Creation of a technology IT center;
- It will boost 1,400 skilled jobs, directly and indirectly;

Indirect impacts

Environmental

- Environmental preservation by the use of renewable energies produced at the wind energy park;

Social

- Stimulate synergies with Beira Interior University in order to develop innovation programs and high level qualifications of the students in IT area;
- Boosting Employment in the area;
- Boosting the local economy through the flow of people (eg, hotels, restaurants, transportation,...);



New Data Center da Concept

Energy efficiency – targets to achieve

The first year of the operation will have a **40% reduction** in energy consumption and about **50% reduction** in carbon emissions.