

For a responsible and sustainable digital future

HOW DOES ORANGE BUSINESS ECO-DESIGN ITS SOLUTIONS AND HELP ITS CUSTOMERS ECO-DESIGN THEIR APPLICATIONS?

Eco-design for a sustainable digital future

An expert report by AdVaes



BACKGROUND



WORKING TOWARDS A SUSTAINABLE DIGITAL FUTURE MEANS TAKING ACTION RIGHT FROM THE DESIGN PHASE AND SERVICES.

ECO-DESIGN IS ALSO A KEY ELEMENT IN ORANGE BUSINESS' SUSTAINABLE DIGITAL APPROACH.



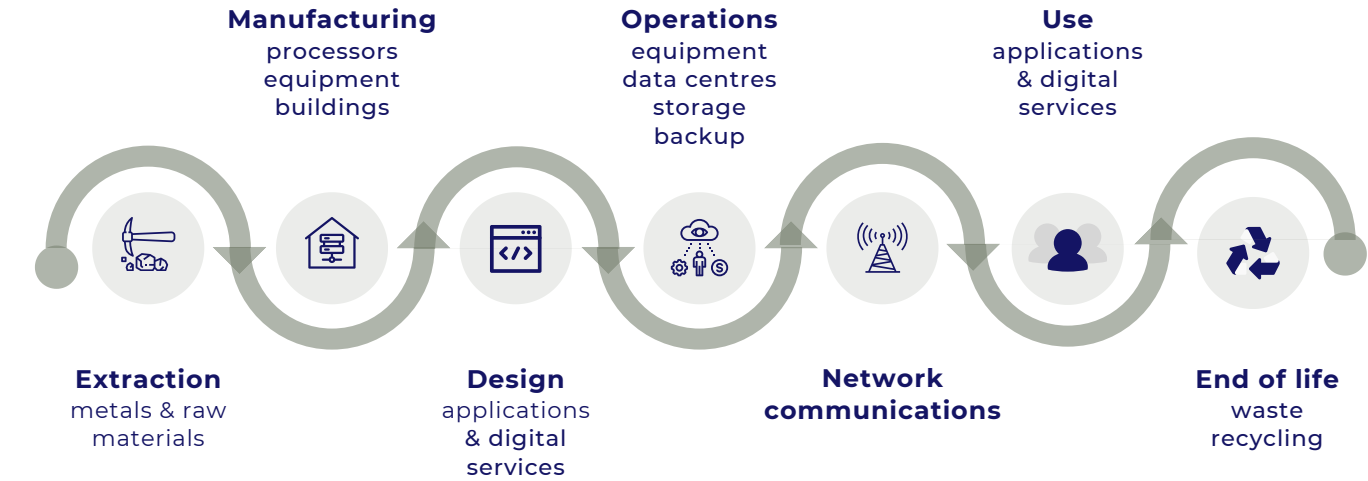
Digital technology with multiple impacts

All digital services are based on a large number of components, including upstream raw materials and metals. These resources are needed to manufacture processors, equipment and network infrastructures, as well as to construct buildings (e.g. data centres) and other structures.

These components, which are used at various points in the service's lifecycle, will have different environmental impacts, of varying degrees of significance:

- The use of large quantities of rare or stressed natural resources during the equipment manufacturing phases (rare metals, water, etc.). A semiconductor plant consumes 7,500 to 15,000 m³ of ultra-pure water per day, the equivalent of 2 to 5 Olympic swimming pools.
- The consumption of carbon-based energy for manufacturing, operations, use and transport of equipment from production sites to consumption sites. The digital sector accounts for 2.5% of France's carbon footprint in 2020 [1].
- Surface pollution during the extraction of raw materials and at the end of the service's life, with the production and burial of hazardous electronic waste. In the European Union, 160,000 laptops are thrown away every day and 3 million tonnes of IT waste are produced every year [2].

Reducing the environmental impact of a digital service also requires a good understanding of its entire life cycle.



Eco-design, a response to reducing the environmental impact of digital technology



There are several ways of reducing the environmental impact of digital technology. They can be classified into two main categories: optimisation and sobriety. Optimisation focuses on reducing environmental impact, not just by reducing CO₂ emissions, but also by taking other criteria into account (scarce resources, water, ionising radiation, etc.). Sobriety, on the other hand, aims to reason about usage.

Eco-design is a solution that simultaneously responds to optimisation (improved energy efficiency, extended lifespan, the fight against programmed obsolescence*, for example) and sobriety (lighter interfaces, elimination of superfluous functions, etc.). It can be seen as a preventive approach. Its aim is to reduce the negative impact of a digital product or service throughout its life cycle, while preserving its usability.

ECO-DESIGN: A CONTINUOUS IMPROVEMENT APPROACH

An essential approach

Eco-design goes beyond the boundaries of digital services and IT to encompass all related fields. Its aim is to design products and services with a view to minimising their environmental footprint at every stage of their life.

ADEME* defines eco-design as "a preventive and innovative approach that makes it possible to reduce the negative impact of a product, service or building on the environment throughout its life cycle, while preserving its qualities of use".

A strong link with life cycle analysis

Life Cycle Assessment (LCA)* is a method for assessing the full environmental impact of a product or service. It helps to identify the areas with the greatest environmental impact, so that these can be reduced.

LCA makes a major contribution to eco-design. It provides precise data on the sources of impact. It enables companies to focus on the key components of a product or service on which reduction actions should be prioritised.

Application to digital services

In simplified terms, a digital service is a system made up of 3 main layers:

- The layer addressing the "users" of the service. More specifically, this layer targets usage terminals such as computers, smartphones, connected objects, etc.
- The "network" layer. This enables data to be transmitted between the 'users' of the service and the 'data centres'.
- The layer dedicated to "data centres". This is responsible for processing, storing and backing up data. This layer includes buildings (data centres), infrastructure and processing resources such as servers, applications and software, programming interfaces, databases, etc.

Any eco-design approach to a digital service includes an assessment of the environmental footprint of all the elements making up the system. It then embarks on a continuous improvement approach, aimed at reducing this footprint, ideally from the design stage of the service and throughout its life cycle, right up to its end of life.



Référentiel Général d'Écoconception de Services Numériques (RGESN) in France

In France, the RGESN*, which can be translated as The General Eco-design Framework for Digital Services, is a reference framework drawn up by DINUM (the French interministerial digital department), the French Ministry for Ecological Transition, ADEME and the Institut du Numérique Responsable*. The 1st version aims to reduce the consumption of IT resources and the obsolescence of equipment by acting on defined criteria, divided into 8 categories [1] :



Strategy

Relevance, challenges and management of digital service design



Specifications

Project framework, resources, objectives and constraints



Architecture

Linking application components between the front-end and back-end



UX/UI*

Definition of the best interfaces for users



Contents

Availability of documents and information media for the end user



Front-end*

Active components on a terminal enabling to use a digital service



Back-end*

Server components enabling the operation of a digital service



Hosting

Hosting resources allocated for use of a digital service

Orange Group definition: "Eco-designing a product or service means taking its environmental impact into account from the very first stages of its design".

THE ORIGINS OF ECO-DESIGN AT ORANGE BUSINESS

TOP-DOWN* INITIATIVE

An initiative supported by the Orange Group via Orange Innovation.

The aim is to implement eco-design methodologies and integrate them into the creation of products and services. By 2025, 100% of products under the Orange brand will be part of an eco-design approach (see "Engage 2020-2025" Plan), and in the longer term for its services.

As part of the Orange Group, Orange Business has joined this internal ecosystem to take advantage of the methodologies developed and integrate them into future service offerings, such as cloud computing.



4 points are systematically taken into account in any eco-design approach: environmental dimensions, customer expectations and requirements, technical feasibility and cost control.

In response to strong regulatory pressure and the expectations of both its customers and suppliers, the Orange Group has launched a number of eco-design initiatives.

Initiatives initiated by employees and carried out within various Orange Group entities, including Orange Business.

These initiatives have developed in response to requests from customers. The Orange Business teams responsible for these initiatives have consolidated their methodological and technical know-how, which is now reflected in an eco-design offer for customers.

This offer helps customers in their own approach and focuses on software and applications, their design and user interfaces (UX). It is based on market standards such as the RGEN.

BOTTOM-UP* INITIATIVE



ECO-DESIGN OF PRODUCTS AND SERVICES

Around fifteen internal projects have already been subjected to the eco-design methodology developed by the Orange Group.

By the end of August 2023, these include the following projects: Orange Internet Portal, Orange Events LAN WIFI, Livebox, Managed Big Data, Cloud Avenue, Bureau Digital Pro, TV Decoder, Live Object Sensors, Welcome Pack Green Card SIM, etc.



"ECO-DESIGN APPLICATIONS" OFFERING

The "Eco-design Applications" offering from Orange Business addresses the eco-design of websites and mobile applications. By extension, application eco-design expertise can now also be applied to decision support and data analysis environments, as well as artificial intelligence (AI) projects.

THE ORANGE GROUP'S ECO-DESIGN METHODOLOGY FOR PRODUCTS AND SERVICES

A structured approach

The Orange Group is adopting a structured approach based on eco-design and circular economy methodologies, which are then deployed operationally in the management processes of its projects, whether they are in ATM (Agile-To-Market) or TTM (Time-To-Market)* mode, for faster and more sustainable time-to-market. The Orange Group's approach, implemented by Orange Business, is based on 4 main stages outlined below. It applies both to application development (web or mobile) and to all the components of an offering (products or services).

Assessment criteria

To assess an eco-design approach, the 4 stages of the process need to be reviewed and measured by giving a score to each of them [1]. The approach has been followed if the final score obtained is equivalent to or higher than 75 out of 100. To validate the approach, an external critical analysis may be carried out by authorised third-party organisations, such as Bureau Veritas. However, not all projects are validated in this way.



For its approach, the Orange Group has selected 13 environmental impact indicators:

- 4 main indicators: climate change, depletion of natural resources, acidification and ionising radiation.
- 3 other secondary but strongly recommended indicators: depletion of water resources, human toxicity and aquatic ecotoxicity.



ORANGE BUSINESS' APPLICATION ECO-DESIGN OFFERING

La genèse de l'offre

Within Orange Business, the first work on eco-design began in 2018. In December 2019, a working group dedicated to eco-design was set up within the "Digital Services" entity. This brings together people from different internal departments, all working on the subject of eco-design.

The success of the work undertaken has made it possible to formalise a commercial eco-design offer for customer applications, as well as setting up an entity focusing on skills, methodology and tools. Today, the people working in this unit, known as 'applications and eco-design', are full-time specialists in the subject. They interact with the teams working on Responsible Digital Design.

Methods and tools

Orange Business' Eco-design Applications offering addresses the design of websites and mobile applications. It is based on a 4-pronged methodology.

As the very first version of the RGEN did not provide a scoring grid, Orange Business chose to build its own audit grid with a compliance matrix.

For customers who have not yet established a "responsible digital" strategy, Orange Business can help them define this strategy at an earlier stage, taking into account the actions already taken and the tools used.

Support can also be provided downstream, post-design, as part of a continuous improvement process.



POINTS OF ATTENTION

At present, there is no standard for measuring the end-to-end impact of website design. Orange Business relies on an open source tool, such as EcoIndex*, on which an overlay has been developed based on an internal tool used during audits.

The approach is based on LCA (Life Cycle Assessment) modelling and a multi-criteria approach that includes water consumption and greenhouse gas emissions. For mobile applications, the ecoCode* tool is used to perform the static analysis and reveal any anomalies.

SCOPE OF THE OFFERING & METHODOLOGY

The offering covers the entire end-to-end chain, with Orange Business able to be involved at any point in the process at the customer's premises.

Raising awareness of the approach

Raising awareness of eco-design
Raising awareness of accessibility



Assessment of the existing service or the project to be carried out

Evaluation of the level of eco-design of the service (measure / RGEN) - Recommendations



Scoping | Support | Implementation

Development of the framework for operations
Provision of an eco-design consultant
Framework of requirements for suppliers



Scaling up | Framework

Definition of the framework
deployment strategy
Management by a certified Green IT expert



USE CASE



APPLICATION ECO-DESIGN

FEEDBACK FROM THE ILLE-ET-VILAINE DEPARTMENTAL COUNCIL (CD35)



A regulatory catalyst

The Conseil Départemental d'Ille-et-Vilaine (CD35) manages a number of websites, including sites providing information on the department's areas of responsibility and other related sites, in particular for publishing online magazines.

As part of a technical overhaul, CD35 decided to improve the level of compliance with accessibility and eco-design requirements for its sites.

Orange Business was chosen to support the CD35 teams in this regard and to integrate all the contributing elements as effectively as possible.



Local authorities and environmental regulations in France

Since 2020, French regulations have been tightened to accelerate the ecological transition of local authorities. The anti-waste law for a circular economy (AGEC for “anti-gaspillage pour une économie circulaire”) requires local authorities to purchase between 20% and 40% recycled supplies. The REEN law, which aims to reduce the environmental footprint of digital technology, requires local authorities with more than 50,000 inhabitants to draw up a responsible digital strategy. This strategy must include targets for reducing the environmental footprint of digital technology, monitoring indicators and concrete measures. Initiatives may cover sustainable public procurement, IT hardware management, eco-design of digital services, raising awareness of IT security, environmental digital education, or the promotion of open data.

Main phases of the project

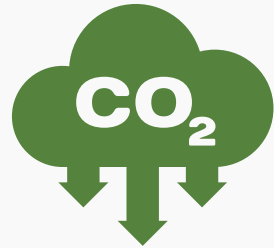
The project began in January 2023. The first websites went online in December 2023, in line with the objectives set. The eco-design declaration published on www.ille-et-vilaine.fr sets out the actions taken and the detailed results.

The redesign was carried out in two main phases:

- A strategic phase (2 months): workshops, then implementation of the requirements for the various phases of the project (design, UI, editorial charter, development, etc.).
- Implementation phase (3 months):
 - Technical workshop with Orange Business development teams.
 - UX design sessions respecting the principles of eco-design and accessibility.
 - Development with control points in unit and functional tests, then enhancement via the eco-design declaration.

THE BENEFITS OF ECO-DESIGN FOR APPLICATIONS

ORANGE BUSINESS' « ECO-DESIGN APPLICATIONS" OFFERING HAS SEVERAL BENEFITS



Improvement in the carbon footprint for Scope 3



Cost reduction



Reducing energy consumption



Improving the customer experience and accessibility



Regulatory compliance



CSR commitment

PROJECT SUCCESS FACTORS

Orange Business has identified four success factors for customer application eco-design projects

- 1 The assurance of strong internal sponsors**
- 2 Have a sufficient level of maturity in terms of the subject matter**
- 3 Agreeing to make binding choices in line with the expectations, in particular of the RGEN**
- 4 Knowing how to resolve conflicts that may arise with teams as a result of the requirements associated with eco-design**

AREAS FOR PROGRESS AND NEXT STEPS FOR ORANGE BUSINESS



Simplifying the methodology

The initial eco-design approach, recommended for products and services, was very comprehensive, with strong internal inertia.

The first methodological document was based on 14 stages. The approach has since been simplified to produce a new methodology document comprising 4 key stages with associated deliverables.

This document is supplemented by definitions, checklists and impact assessments.



Making LCAs easier to carry out

Lifecycle analyses of digital services, which underpin eco-design initiatives, are difficult to implement because of the difficulties encountered in measuring certain criteria. They need to be made easier to carry out.

LCAs also take a long time to set up, and Orange Business is trying to simplify them for its services.

Adaptations to this effect are planned.



Raising awareness and training

ESG has become a priority for the Orange Group. The teams involved in this area, including those at Orange Business, have acquired knowledge and expertise. In fact, Orange Business was one of the pioneers of the eco-design programme launched at Orange Group level, actively contributing to the various discussion and working groups.

The next step is to mobilise all the departments concerned internally to incorporate an eco-design approach into their practices. The learning curve is there, and so is the expertise. Now we need to roll it out, make it our own, and scale it up. The awareness-raising and training plan deployed internally is working towards this goal.



Consolidating achievements

For its "Eco-design Applications" offering for customers, Orange Business intends to :

- Consolidate the framework developed, improve it and implement it on a larger scale.
- Seek internal partnerships to bring together skills and expertise on the subject within a single team.

GLOSSARY

ADEME (Agence de la transition écologique): French Agency for Ecological Transition, under the supervision of the French Ministries of Ecological Transition and Territorial Cohesion, Energy Transition and Higher Education and Research.

Agile-To-Market (ATM): Rapid decision-making strategy that reacts to events in real time. Its aim is to enable companies to move forward quickly and achieve results at different stages of a project.

Bottom-up approach: An approach that starts at the most detailed level in the company and then progresses upwards.

Back-end: IT environments hosting applications and/or managing data processing, storage, etc. The back-end is responsible for managing the background operations that enable the user interface to run correctly.

Design UI (User Interface): Aims to improve the interaction between a user and a product. Its main objective is to encourage engagement by designing appropriate tools.

Design UX (User eXperience): Involves analysing users' expectations and requirements when designing websites or mobile applications, and more broadly IT applications, taking into account their experience when browsing and using them. The aim is to optimise the user journey to make it more intuitive and easier.

ecoCode: A collective that brings together a variety of players, including research laboratories, companies, working professionals and freelancers, working together to promote more responsible computing. Active members of this community design and implement guidelines to identify aspects of project source code likely to have a negative environmental impact, and share these resources in open source..

EcoIndex: An online tool for raising awareness of the environmental impact of the Internet and proposing practical solutions.

Front-end: Refers to the part of an application or system with which the user interacts directly. The front-end encompasses the user interface, the design and the elements of the user experience that are visible and accessible to users.

Institut du Numérique Responsable (INR): French association of companies and organisations working together to encourage and support initiatives aimed at making digital technology more environmentally friendly, inclusive, supportive and ethical.

LCA (Life Cycle Assessment): LCA "identifies and quantifies the physical flows of matter and energy associated with human activities throughout the life of products. It assesses the potential impacts and then interprets the results obtained according to its initial objectives", according to [ADEME](#).

Obsolescence: Refers to the phenomenon where a product or service becomes obsolete, losing part of its functionality, even if it remains in good condition.

Référentiel général d'écoconception de services numériques (RGESN): A [reference framework](#) co-developed by the French Interministerial Digital Department (DINUM), the French Ministry for Ecological Transition, ADEME and the Institut du Numérique Responsable, to reduce the consumption of IT and energy resources, and to help reduce the obsolescence of equipment (PCs, screens, servers, network equipment).

Time-To-Market (TTM): Corresponds to the period between the creation of a product and its introduction on the market, encompassing the entire marketing process.

Top-down approach: An approach that starts at the highest level of the company (and then spreads down to the lower levels).

ABOUT

Methodology

The information analysed and published in this report comes from internal Orange Business documents (reports, technical documentation, use case studies, notes and internal work), interviews with experts on the subject addressed, supplemented by information from recognised external public sources and/or AdVaes internal databases and analyses.

CSR at Orange Group

As a subsidiary of the Orange Group, Orange Business follows the charter of its majority shareholder.

[This charter is available on the Group's website.](#)

The Orange Group's Corporate Social Responsibility (CSR) policy focuses on the following areas:

- Governance;
- Fundamental freedoms;
- Digital inclusion and territories
- Ecological and energy transition;
- Responsible products, services and uses;
- And the responsible employer.

Detailed information on the Orange Group's CSR policy and commitments is available on the online media library: gallery.orange.com/RSE.

About Orange Business

Orange Business is a digital services company belonging to the Orange Group, with expertise in networks, connectivity and digital solutions integration (service platforms, data analysis, cloud solutions, etc.).

The company supports private companies and public organisations worldwide in their sustainable digital transformation. It combines a global presence with a local approach, supported by more than 29,000 employees who are experts in business issues. It defends an ethical, responsible and inclusive vision of digital, while helping its customers to reinvent their services.

About AdVaes

AdVaes is a neutral and independent market intelligence and operational strategy consultancy specialising in the analysis of cloud computing and data markets and the ESG approaches of digital service providers.

The company helps organisations to develop and implement their strategy, to enhance the value of their actions and investments, and to make informed decisions in terms of innovation with the cloud, and on ESG issues of digital and reducing the environmental impact of IT activities. The company supports executives, their managers and their employees in 4 operational areas: insights, assessments, anticipation and/or awareness.



**ORANGE BUSINESS
THANKS ADVAES
AND ITS INTERNAL
TEAMS FOR THEIR
CONTRIBUTION TO
THE PREPARATION
OF THIS REPORT.**



Business



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