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GREEN ANIMATION GUIDE

An international resource for sustainable practices in the animation industry

2025 edition

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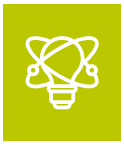

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INTRO 1

The environmental challenges facing the animation industry

The environmental crisis demands immediate, systemic change across all industries, and the animation sector is no exception. As a digital-native medium with rapid technological evolution, animation must confront both the visible and invisible consequences of its production models. It is uniquely positioned at the intersection of two powerful forces: the ability to shape cultural narratives through storytelling, and the reality of its own environmental footprint as a technologically intensive industry.

This dual responsibility is particularly important. On one hand, animation has a significant influence on public imagination,particularly among younger audiences. Animated stories frequently reach children and adolescents, who are both the most impressionable viewers and those who will inherit the environmental challenges of tomorrow. The sector therefore carries a unique cultural responsibility: it not only entertains but also informs and inspires.

On the other hand, animation must also address its direct environmental impacts. As a data-driven and compute-intensive industry, animation relies heavily on digital workflows, including modeling, simulation, rendering, and cloud storage. While these processes may seem dematerialized, they are far from impact-free. Global data storage alone consumes between 240 and 340 terawatt-hours (TWh) of electricity each year (International Energy Agency, 2022), roughly 1 to 1.3 percent of global energy consumption, with data center operations projected to grow. Animation studios contribute to this system through rendering farms, always-on infrastructure, and the rapid refresh cycles of high-performance hardware.

Yet, despite its environmental weight, the footprint of animation remains poorly documented. There is still a critical lack of sector-specific data, which hinders both awareness and the development of appropriate reduction strategies. The invisible nature of its emissions, compared to the physical waste of live-action productions, often leads to underestimation. Without visible trucks, flights, or film sets, the environmental toll of animation risks being ignored, even within the industry itself.

Moreover, animation is inherently international. Productions often involve teams across several continents, moving digital assets between regions with vastly different energy mixes and regulatory frameworks. This globalization amplifies the complexity of managing emissions and calls for coordinated, transnational solutions that reflect the distributed nature of the creative process. How can the industry harmonize its sustainability efforts across borders while respecting the unique constraints of each region?

In this context, animation is not only a sector at risk, it is also a sector with enormous potential to lead. Its deep integration with technology, particularly emerging tools such as real-time engines and artificial intelligence, makes it a powerful testing ground for responsible innovation. But innovation must not come at any cost. In 2019, the digital sector emitted around 1.4 billion tonnes of CO_2e, or 3.7 percent of global GHG emissions, according to The Shift Project's report «Lean ICT: Towards Digital Sobriety». As animation continues to adopt cutting-edge tools like AI, which promise gains in speed and creative freedom, the energy demands and embodied emissions of these technologies must be carefully evaluated.

By embedding sustainability into both its creative processes and technical infrastructure, the animation industry has the potential to become a leading model for aligning artistic innovation with environmental responsibility. The tools are emerging. The narratives are ours to shape. What is required now is a collective commitment to action, grounded in the very creativity that defines the industry, and directed toward building a more sustainable future.

INTRO 2

The green guide for animation initiative: a collaborative French effort, now reaching the international stage

In this context, the Green Guide for Animation was launched in June 2023 at the Annecy International Animation Film Festival. The guide was developed in France by Ecoprod and La Cartouch'Verte, with support from AnimFrance, Magelis, and Auvergne-Rhône-Alpes in Motion, and thanks to the contributions of more than 40 professionals from across the French animation sector: producers, artists, studio heads, technical directors, broadcasters, sustainability experts, and service providers.

Designed as a free, practical tool, the guide includes over 60 fact sheets and 150 concrete actions, each tailored to different studio types and roles across the 2D and 3D animation production chain. It covers topics ranging from infrastructure, IT equipment, and workflows, to studio life, employee mobility, food choices, training, communication, and even merchandise.

The original guide, coordinated by Frédérique Cauvin-Doumic, was the result of collective knowledge-sharing and hands-on experience gathered from pioneering studios. It was designed to evolve continuously, drawing on field data and user feedback.

Following the success of the French edition, an international collaboration was launched to adapt and expand the guide for broader use. Ecoprod joined forces with CineRegio, Green Film, and a network of European partners including ALCA Nouvelle-Aquitaine, Catalunya Film Commission (ICEC), EC1 Łódź – Miasto Kultury, Film London, Film Paris Region, Screen Scotland, Trentino Film Commission & Fund, and Viken Filmsenter AS. Together, these organizations formed a working group to develop this international version of the guide. The internationalization of the guide was coordinated by Adrien Roche and Alissa Aubenque from the Ecoprod team, with the valuable contribution of Valentina Huckova, helping to ensure consistency and relevance across different regional contexts.

This ongoing initiative represents a collective commitment to harmonizing sustainability practices across borders. It also lays the foundation for future goals, including the development of a certification scheme for sustainable animation productions, in partnership with Ecoprod, Green Film, and CineRegio.

As the leading sustainable production initiative in France, Ecoprod, a non profit organisation founded in 2009, brings together over 450 industry stakeholders. Its mission is to support professionals through training, collaborative tools, impact measurement systems and certification programs. With a growing international presence, Ecoprod also coordinates StepUP, a European platform that provides a shared e-learning and sustainability toolkit for the film and animation sectors.

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This guide, in its international version, is the result of a collective and cross-disciplinary effort. It reflects the expertise, values, and commitment of dozens of contributors and partner organizations, all dedicated to enabling a just, creative, and measurable ecological transition for the animation sector worldwide. When it comes to sustainability, there is no one-size-fits-all solution. Every company operates within a specific context, shaped by its size, location, resources, and regulatory environment. What works in one country may not be feasible in another due to differences in infrastructure, access to technology, or local climate conditions. Rather than prescribing a single path, this guide provides principles, tools, and concrete examples that can be adapted to your reality, wherever you are, and whatever stage you are at in your sustainability journey.

We warmly thank all the professionals who, through interviews, insights, thoughtful remarks or constructive feedback, contributed in various ways to both the French and international versions of this guide, helping us to enrich its content, question its approach and ensure its evolution towards a more inclusive and operational resource for the animation sector.

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INTRO 3

Navigating this guide

The Green Animation Guide is designed for all professionals involved in the animation sector, across both 2D and 3D production pipelines. Whether you are working at a small independent studio or a large international company, this guide offers practical strategies tailored to a wide range of roles and responsibilities.

Part 1 – Buildings and offices is particularly relevant for studio managers, office coordinators, production managers, HR personnel, and sustainability officers. It also provides insights for facilities managers and administrative teams involved in real estate decisions or day-to-day operations.

Part 2 – Studio infrastructure is intended for IT managers, technical directors (TDs), pipeline developers, network administrators, rendering supervisors, and studio executives involved in hardware procurement, data management, or digital governance.

Part 3 – Workflow and production practices targets animation supervisors, production managers, lead artists, riggers, compositors, rendering artists, asset managers, and pipeline TDs. It is also relevant for creative directors, project coordinators, and freelancers working on digital assets, post-production, or rendering.

Part 4 – Food and catering will interest HR departments, studio managers, office coordinators, and any team member involved in organizing collective meals or managing studio kitchens and facilities.

Part 5 – Transportation addresses producers, line producers, coordinators, and team leaders managing crew logistics and travel. It is also relevant for sustainability consultants and companies working on green travel policies.

Part 6 – Content and merchandising is designed for producers, screenwriters, directors, art directors, marketing and licensing teams, and studio executives. It also speaks to communications officers and anyone involved in audience strategy, editorial development, or brand partnerships.

Throughout the guide, cross-cutting recommendations are relevant to CSR (Corporate Social Responsibility) managers, studio founders, educators, and public funders who wish to foster more sustainable practices across the animation ecosystem.

INTRO 4

Key concepts

Before taking action, it is essential to understand a few core concepts that underpin the entire guide.

Digital sobriety

Digital sobriety means using digital tools more responsibly, not just making them more efficient, but questioning their necessity. In the context of animation, this could mean reducing the number of render iterations, avoiding unnecessary file storage, or resisting over-equipping artists. It is about doing better with less, and only when needed.

The 5Rs approach

The 5Rs : Refuse, Reduce, Reuse, Repair, Recycle, form a hierarchy of responsible action. The earlier an action appears in the chain, the more impactful it is. For example, refusing to buy unnecessary equipment is more effective than recycling it at the end of its life. This mindset applies to physical items like computers and props, as well as to digital content such as assets and software.

Combating the rebound effect

Improvements in efficiency can sometimes lead to increased consumption, a phenomenon known as the rebound effect. For instance, faster rendering may lead to more unnecessary versions being generated. Being aware of this risk helps ensure that gains are not lost through excessive use or new habits that increase impact.

Systemic thinking

Environmental responsibility is not about isolated gestures, but about aligning everyday decisions across the entire workflow. From how projects are planned to how food is consumed in the studio, every element is interconnected. The most effective actions come from a shared logic, not from one-off measures.

Resource pooling

Resource pooling provides animation studios with an effective strategy to overcome individual limitations and accelerate the adoption of sustainable practices. By consolidating efforts and participating in shared initiatives, studios can implement solutions that would be challenging to achieve independently, while collectively influencing industry standards and public policy. Examples include joint working groups on carbon calculation tools, shared infrastructure projects, coordinated waste management systems, or common services such as dining facilities or mobility solutions. This approach enhances operational efficiency, optimizes costs, and reinforces the sector's capacity to drive systemic and lasting environmental improvements.

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Carbon footprint

Carbon measurement is the process of quantifying greenhouse gas (GHG) emissions linked to a company's activities, services, or products. It is a foundational step toward managing and reducing environmental impact. It allows not only to have an understanding of the GHG emitted by the activities of an animation studio but especially to understand which of these activities have the highest carbon footprint and on which it is most urgent to take action. In the animation sector, measuring emissions is particularly important because a large share of the footprint comes from digital activities that are often invisible: computing infrastructure, rendering, data storage, and employee mobility.

In practice, carbon footprint is a standardized process that involves collecting data (such as electricity consumption, equipment purchases, travel, etc.), associating it with standardized emission factors, and calculating the resulting carbon footprint. Internationally recognized frameworks like the Greenhouse Gas Protocol (GHG) or national standards guide the process.

There are two approaches in the GHG Protocol to measure a carbon footprint that are relevant for the animation industry:

- The corporate standard, that can be used to measure the footprint of a studio or production company, including both cross-company activities and project-related activities over the scope of one year.
- The project standard, that can be used to specifically measure the footprint of one project (film, series,...) during its entire production process over multiple years.

To establish a carbon footprint, you can either work with specialized consultants or use a sector-specific carbon calculator. Various tools have been developed specifically for the film and TV industry.

Because the unique technical workflows of animation were not fully covered by generic carbon calculators, a specialized tool was developed in France called "Carbulator". Led by AnimFrance and supported by partners including Ecoprod, Carbulator is the first carbon calculator specifically designed for animation production. It allows studios to measure the emissions linked to infrastructures, asset production, software use, rendering, and more, with a methodology adapted to the realities of the animated film industry (3D and 2D).

Measuring carbon emissions is not an end in itself: it is a strategic tool. Carbon footprint enables studios to:

- set realistic reduction targets,
- prioritize the most impactful actions,
- track carbon emissions,
- communicate transparently,
- and join a global movement toward a more sustainable creative industry

Beyond carbon measurement, studios can engage in broader CSR frameworks, such as the Ecoprod label for production companies, or join ongoing initiatives by Ecoprod, Cine Regio, Green Film and CEE Animation to develop European sustainability standards for animation. As this process is underway, future updates may include formalised certification schemes.

INTRO 5

Practical entry points for action

Taking climate action within the animation sector requires both ambition and structure. While the solutions outlined in this guide are diverse and adaptable, they are most effective when part of a long-term, collaborative effort. Several strategic entry points can help studios move from intention to transformation, regardless of size or location.

Train to act

Training is the foundation of any sustainable transition. From creative leads to IT managers, all team members should understand the environmental impacts of their work and the practical tools available to reduce them. Leadership must lead by example, and sustainability coordinators, when designated, need dedicated training in digital sustainability, corporate social responsibility (CSR), and green production. National and regional initiatives, as well as sector-specific platforms, such as StepUP by Ecoprod, or Green Toolkit Film&TV, are increasingly making such training accessible.

Build internal governance

Sustainability cannot rely solely on individual efforts. Studios benefit from defining clear responsibilities, whether through a CSR steering committee, a green transition working group, or a dedicated sustainability manager. Establishing a framework for continuous improvement, using methods like DMAIC (Define, Measure, Analyze, Improve, Check), allows studios to track progress over time and adjust their strategies as needed. Structuring the approach also supports employee engagement, which is critical for long-term success.

Measure, then reduce

Understanding your studio's footprint is the first step toward reducing it. Carbon footprint assessments provide a global picture of your environmental impact and help prioritize areas for improvement. A dedicated tool called the Carbulator, developed by AnimFrance, is being piloted to help animation studios calculate and reduce their greenhouse gas emissions. Designed for all film industry professionals, the tool is intended for use not only in France but internationally.

Make your values visible with integrity

Sustainability is as much a cultural shift as it is a technical one. Sharing your studio's commitments, through a sustainability charter, a green memo, or office signage, helps embed eco-responsibility into daily operations. However, transparency is crucial. Avoid greenwashing, as misleading or exaggerated environmental claims can be considered deceptive commercial practices and are increasingly subject to legal penalties in many countries. Any public environmental commitment should be based on real actions, measurable progress, and honest communication.

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Invest in the transition

A sustainability strategy requires dedicated resources. Allocating a specific budget to support green initiatives, training, audits, certifications, sustainable catering, low-impact IT, is both a signal of intent and a practical necessity. Three-year funding frameworks allow for structured deployment and measurable returns. Studios that view this not as a cost, but as an investment in resilience, performance, and reputation, will be better equipped for future demands.

Think long-term and systemically

Beyond immediate operational changes, studios are encouraged to engage in forward thinking. What will energy, digital infrastructure, and raw material access look like in 2030 or 2040? How will roles evolve? Joining working groups, reading studies, and contributing to strategic conversations, such as those hosted by Ecoprod or sector-specific clusters, helps studios anticipate risks and innovate responsibly.

Implement a digital sobriety approach

Optimizing IT infrastructure is a key pillar of environmental responsibility. Studios should appoint Green IT and Green TD managers, adopt continuous improvement methods like DMAIC, and encourage collective responsibility for digital impacts. A well-structured digital sobriety strategy enables significant energy savings and longer equipment life spans. Studios such as Aardman Animations (UK) and Framestore (UK, US, CA) have already integrated these practices into their IT governance.

Understand and act on the carbon intensity of your energy supply

The carbon footprint of electricity varies greatly depending on the local energy mix. Studios should monitor this through tools like Electricity Maps, prioritize low-carbon energy contracts, and schedule energy-intensive tasks during periods of lower grid intensity. Selecting certified green energy suppliers, such as those using Guarantees of Origin (Europe), Green-e (North America), or I-REC (global), can reduce scope 2 emissions. Studios with long-term occupancy may also install rooftop solar systems, as done by Cartoon Saloon in Ireland, or join renewable energy cooperatives and Power Purchase Agreements to support new clean energy capacity. When using cloud services, studios should request data on energy sources and emissions from providers, integrating these criteria into procurement. Additional measures include battery storage, smart consumption timing, and efficient HVAC and lighting management, all contributing to emissions reduction, energy resilience, and cost efficiency.

SPOT LIGHT

Artificial intelligence and sustainability

1. Why AI and sustainability must be addressed together

The rapid integration of artificial intelligence (AI) into the animation sector represents both an opportunity and a critical point of reflection. While AI-driven tools are transforming animation workflows, they also raise new questions about environmental responsibility, technological dependence, and long-term sustainability.

Globally, the environmental impact of digital technologies is under increasing scrutiny. According to a 2023 report from the International Energy Agency (IEA), data centres, AI systems and related digital infrastructure could consume up to 1,000 TWh of electricity annually by 2026 worldwide, roughly equivalent to Japan's annual electricity consumption. A single large AI model can require hundreds of megawatt-hours to train, depending on its size and training duration. For instance, OpenAI's GPT-3 reportedly required 1,287 MWh of electricity to train (source: Patterson et al., Carbon Emissions and Large Neural Network Training, 2021), emitting over 550 tons of CO_2e. This is comparable to the annual carbon footprint of dozens of households, or roughly equivalent to the production emissions of a live-action feature film with a €10 million budget, considering that a €7 million film typically generates around 300 tons of CO_2e.

In the animation sector, AI is primarily used today to accelerate repetitive or technically complex stages of production. This includes, following the typical 3D production workflow: concept art, storyboarding, asset creation, animation, rendering, and upscaling images. These applications encompass generating procedural animations, assisting in rendering or asset creation, and automating visual tasks. While these tools promise an increase in productivity and creative freedom, they may also encourage overproduction or reduce the incentive to design efficient pipelines, especially when environmental considerations are not integrated into the decision-making process.

Sustainability and AI must therefore be addressed together. The industry cannot afford to adopt AI simply because it is available; it must weigh environmental costs, ethical considerations, and real creative needs. Moreover, this discussion is not limited to the back-end of production. As animation studios increasingly incorporate AI into storytelling, character behaviour, and real-time rendering, they shape not only how content is made, but what kind of narratives are technologically possible or economically viable.

The aim of this chapter is to provide studios, producers, artists, and technical teams with a clear understanding of the environmental and ethical stakes associated with AI in animation, along with actionable levers to support responsible adoption. AI is not a neutral tool. How, when, and why it is used will shape the future of the animation industry, as well as its environmental footprint.

SPOT LIGHT

Artificial intelligence and sustainability

2. AI Glossary

The following glossary defines the principal AI-related terms.

Artificial Intelligence (AI)

It refers broadly to the development of computer systems capable of performing tasks that typically require human intelligence, such as learning, decision-making, or pattern recognition. In animation, AI encompasses a wide range of tools, from automatic rigging assistants to virtual character behaviors.

Machine Learning (ML)

It is a subset of AI where algorithms are trained on data to identify patterns and make predictions or decisions without explicit programming. In animation, ML can be used to optimize asset classification, automate lip-syncing, predict animation curves, or assist in layout automation.

Deep Learning (DL)

It is a subfield of Machine Learning that uses artificial neural networks with multiple layers to model complex patterns in large datasets. In animation, DL can power more advanced tools such as facial motion capture refinement, procedural generation of textures, and deepfake-style reanimation of characters.

Neural networks

They are computational systems inspired by the human brain's structure. They process data through interconnected layers of nodes (neurons) that can learn to recognize patterns. Neural networks are commonly used for style transfer in animation (applying a visual style to animation frames) or super-resolution upscaling of rendered images.

Training vs. Inference

Training refers to the initial phase where an AI model learns from data. This phase is extremely energy-intensive, particularly for deep learning models.

Inference is the use of a trained model to generate output (e.g., applying an AI upscaler to a frame). Inference is generally less energy-demanding, especially for localized, smaller models.

Generative AI

Generative AI models create new content, such as images, sounds, text, or video, based on patterns learned during training. Generative AI is being explored for concept art generation, background creation, texture generation, voice synthesis, and even rough storyboarding. Its energy consumption can vary significantly depending on whether lightweight or heavyweight models are used.

Scripting and plugins

Scripts and plugins refer to small automation programs or extensions integrated into traditional production software like Maya, Blender, or Toon Boom. They often rely on rule-based logic rather than machine learning. Scripting automates repetitive tasks (such as batch rendering or naming conventions) with a minimal environmental footprint during operation, but a significant gain in production efficiency. Unlike Generative AI, their carbon impact is negligible once deployed.

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Procedural systems

Procedural generation uses algorithms to automatically create data (such as landscapes, particle systems, or crowd simulations) without manual intervention. Procedural systems can reduce production time for large-scale background environments or simulation-heavy scenes, with lower energy costs than many AI-based generative methods.

Foundation models

Foundation Models are large AI models trained on massive datasets, capable of performing a wide range of tasks with minimal fine-tuning. General-purpose models (like image-generation engines) are now being adapted for asset generation or creative ideation. However, their training cost is extremely high, raising environmental concerns.

Fine-tuning

Fine-tuning is the practice of adapting a pre-trained model to a specific task using a smaller dataset. Animation studios may fine-tune a generative model to match a series' graphic style, reducing the need for fully manual asset creation while still maintaining stylistic consistency.

Good to know

Traditional scripts that have been developed by programmers have quite limited environmental impact beyond their development phase.

AI Plugins are often trained using machine learning to perform targeted tasks such as noise reduction, frame interpolation, upscale, or object detection. While the training phase can be energy-intensive, their use, especially when run locally on workstations without relying on generative models, results in relatively low ongoing energy consumption.

Generative AI models have a significantly higher environmental footprint. They require substantial energy not only during the training phase but also during inference, particularly for tasks involving complex or high-resolution outputs, due to the intensive data processing involved to produce each output.

Studios must differentiate carefully between internal optimizations (low impact) and external generative solutions (potentially high impact) when evaluating sustainability.

SPOT LIGHT

Artificial intelligence and sustainability

3. Current and emerging applications of AI in animation

Artificial intelligence is being adopted across various stages of the animation pipeline, offering both new capabilities and workflow optimizations. While many tools remain in active development, studios increasingly integrate AI to accelerate processes, reduce costs, or explore new creative directions. These applications span both 2D and 3D production environments, with varying levels of maturity and impact.

Scriptwriting and pre-production

AI-driven language models are being used to support narrative development, assist with dialogue writing, and generate pitch documents. In animation, where series formats often demand rapid turnaround and tight coordination across writing teams, tools like ChatGPT or Claude can help produce first drafts, scene outlines, or synopsis variations.

In pre-visualization, some studios use generative image models such as Midjourney or Stable Diffusion to produce early concept art, moodboards, or framing studies. These visuals are generally used as internal references rather than production assets, especially due to concerns around originality and intellectual property.

Visual design and art direction

Generative tools are also used during concept art and style development. For 2D pipelines, AI can assist with style transfer, palette suggestions, or background generation. In 3D, AI plugins can automate the creation of texture maps, lighting presets, or environment prototypes based on text prompts or layout descriptions.

In both 2D and 3D workflows, these tools do not replace the work of artists but serve as accelerators, generating variations or filling in base layers that are later refined manually. Integration remains most common in the earliest stages of production (look development, pre-production), where flexibility and iteration are key.

Layout and animation

AI is increasingly used to automate or assist with layout, including camera path planning, scene population, and environment consistency checks. Tools such as Autodesk's AI-based layout features or NVIDIA Omniverse's collaborative environments are emerging in larger studio pipelines.

For character animation, AI offers tools for automatic in-betweening, lip-sync alignment, motion capture cleanup, and gesture interpolation. These are used both in 2D (e.g. in-between generation) and in 3D (e.g. facial tracking, pose smoothing). While quality control is essential, these tools can significantly reduce repetitive tasks in animation-heavy productions.

However, animation-specific constraints such as stylization, exaggeration, or narrative rhythm often require manual oversight. As a result, AI in animation is used primarily for support, enhancing efficiency without replacing core creative processes.

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Compositing and rendering

In rendering workflows, AI is already widely used. Denoising algorithms (e.g., Intel Open Image Denoise, NVIDIA OptiX) allow studios to render at lower sample rates while maintaining image quality. This reduces both rendering time and energy consumption, particularly in 3D pipelines.

In compositing, AI is used for rotoscoping, frame interpolation, background separation, and matte generation. Adobe's Sensei technology, for example, is now integrated into After Effects for automated object removal and stabilization, offering substantial time savings.

These tools help reduce manual effort in post-production while maintaining consistency in outputs. They are especially useful for episodic formats where templates can be reused and refined over time.

Voice and audio

AI voice synthesis tools, such as ElevenLabs, Respeecher, or Descript, are being used to generate temporary dialogue for animatics or rough cuts. This is particularly useful in 2D animation, where storyboarding and animation validation are essential phases. AI-generated voices help test pacing, tone, and performance before casting.

In sound design, early experiments with generative audio tools allow for the creation of ambience or sound effects from textual descriptions. While not yet widely adopted in professional post-production, these tools show potential for previsualization and small-scale productions.

Marketing and distribution

AI is also being used beyond the creative pipeline. Tools for automatic subtitling, dubbing, and translation, such as Whisper or DeepL, support the internationalization of animated content. Marketing departments increasingly use AI to generate visuals for social media, variant artwork, or promotional clips based on existing production assets.

In the animation sector, AI primarily serves to enhance and accelerate existing workflows. The most impactful use cases currently include rendering optimization, layout automation, and voice generation for previsualization. However, each application must be evaluated in terms of quality, creative integrity, and environmental impact. The distinction between generative AI (creating new data) and assistive AI (enhancing or organizing existing content) is essential for understanding both the benefits and the risks of these tools.

SPOT LIGHT

Artificial intelligence and sustainability

4. Environmental impacts of AI in animation workflows

The integration of artificial intelligence into animation pipelines introduces new environmental considerations, particularly in terms of energy use, hardware requirements, and the lifecycle of digital infrastructure. While AI tools can generate operational efficiencies and reduce repetitive tasks, their adoption inevitably increases the overall computational load across different stages of production and requires careful evaluation of their overall footprint.

Energy consumption of AI Workloads

AI models, especially those involving deep learning, are highly energy-intensive. Training large generative models such as GPT-4 or Stable Diffusion can consume hundreds of megawatt-hours (MWh) of electricity. For instance, a 2022 study by Hugging Face and Carnegie Mellon University estimated that training BLOOM (a large open-source language model) required approximately 433 MWh of energy, emitting around 50 tonnes of CO_2e depending on the data center's location and energy mix.

While most animation studios do not train their own large-scale models, they frequently rely on inference (using pretrained models), which still demands significant computational power to datacenters that run models, particularly when using text-to-image generation, voice synthesis, or motion prediction. These processes can become substantial when scaled across an entire production.

In a 3D animation pipeline, for example, the use of AI-assisted rendering, rotoscoping, or automated layout may shift energy demand from the traditional render farm to GPU usage, local or Cloud-based. According to the International Energy Agency (IEA), GPUs used for AI workloads consume significantly more electricity than CPUs, particularly when running continuously or executing parallel tasks. This higher energy demand becomes especially critical when studios choose to run AI tools locally on their own GPU-equipped machines, rather than relying on external cloud-based APIs, which may benefit from more energy-efficient infrastructure or aggregated workloads.

Freshwater consumption

Beyond its carbon footprint, the rapid growth of AI also raises serious concerns about freshwater usage. Data centers that power AI models rely heavily on water for cooling their high-performance computing infrastructure. To prevent overheating, many facilities use evaporative cooling systems that consume vast quantities of water. For example, training a single large generative AI model can use between 5 to 10 million liters of water. In 2022, it was reported that Microsoft used over 1.7 billion liters of water in a single year, an increase driven in part by the development of AI systems. This level of consumption places added stress on local water resources, particularly in regions already facing drought or water scarcity, and makes the sustainability of AI development a growing concern.

→ see next page

Hardware embodied emissions

The environmental footprint of AI extends beyond electricity. High-performance GPUs and workstations required to run generative tools have a heavy embodied carbon cost. As detailed in studies by the French Agency for Ecological Transition (ADEME) and the German Öko-Institut, manufacturing a single high-end GPU can result in 300 to 500 kg of CO_2e, due to the extraction and transformation of rare materials such as cobalt, tantalum, and neodymium. The growing need for digital data storage is no exception. Each hard drive or SSD has a considerable carbon impact during manufacture, estimated at between 20 and 160kgCO2e/TB.

In animation studios, these GPUs are often embedded in workstations that are replaced every 3 to 5 years, shorter than the potential lifespan of the equipment. Increasing reliance on AI tools may accelerate this turnover, reinforcing cycles of obsolescence and e-waste.

Additionally, many AI models require local storage of large datasets (up to several terabytes), which contributes to the overall infrastructure footprint. Without adequate versioning, storage optimization, and data lifecycle policies, this digital volume can increase significantly over time.

Cloud versus local impact

Some studios outsource AI processing to cloud services, which may reduce local electricity use but not overall emissions. The carbon footprint of cloud services depends heavily on the energy mix of the data centers used. For example, a server farm located in Sweden (average grid intensity < 30 gCO_2e/kWh) will emit far less than one located in Poland (> 600 gCO_2e/kWh), even for identical electricity consumption.

Animation studios must request transparency from cloud providers on data center location, Power Usage Effectiveness (PUE), percentage of renewable energy used or cooling systems (e.g. water or air).

Platforms like Google Cloud, AWS, and Azure may offer some of this data, but not all services provide full and detailed emissions breakdowns.

SPOT LIGHT

Artificial intelligence and sustainability

5. Anticipating the movements

The integration of artificial intelligence into animation is expected to accelerate significantly, driven by advances in model performance, accessibility, and regulatory frameworks.

Major improvements in generative quality

Multimodal AI systems capable of producing consistent, high-quality outputs in image, dialogue, and video generation will become more widespread. Tools like Sora (OpenAI), Runway (Runway AI, Inc), or Kling (Kuaishou) already demonstrate the potential for near-production-grade sequences.

For animation, this means storyboarding, previsualization, and animatics could be automated or hybridized with minimal human retouching, raising new questions about creative control and authorship.

Democratization of no-code AI tools

The development of intuitive interfaces for AI-driven creation will allow non-specialists to generate animated content with little or no programming experience. This will open new doors for independent creators, educational applications, and rapid prototyping. However, it may also blur professional boundaries and increase the volume of low-quality content, pushing studios to differentiate themselves through editorial quality and ethical practices.

Standardization of hybrid pipelines

Studios are expected to progressively adopt hybrid production workflows combining real-time 3D, procedural tools, and AI automation. This evolution is particularly relevant for short-form content, advertising, and stylized productions, where time-to-screen is critical. Tools for shot tracking, versioning, and AI-assisted clean-up are likely to be integrated directly into mainstream production management systems.

New legal and regulatory requirements

Several governments and international bodies are currently drafting or enforcing laws on AI transparency, copyright attribution, and environmental disclosure. The European Union's AI Act and the proposed AI liability directive will affect animation workflows that rely on generative tools. Studios will increasingly be required to document the provenance of their AI-generated assets and disclose their use to clients and audiences.

Increased demand for low impact AI («green AI»)

As the energy footprint of AI becomes better understood, studios will face growing pressure to use models optimized for energy efficiency. Research is advancing on quantifying the environmental cost per training cycle or inference. This will push studios to favor lighter models, share GPU resources, and choose providers that commit to renewable energy use and hardware reuse.

SPOT LIGHT

Artificial intelligence and sustainability

6. Levers for a responsible use of AI

While the creative potential of artificial intelligence is undeniable, studios must adopt responsible practices to manage its environmental, social, and legal implications. Below are key levers that animation professionals can activate immediately:

Choose lightweight and optimized models

Use smaller, fine-tuned AI models when possible, especially for repetitive or background tasks.

> For instance, some French studios working with style transfer tools now prefer "distilled" models that reduce GPU usage by 60 to 80 percent, with no loss of visual quality for storyboard or previz work. In Canada, several teams use LoRA (Low-Rank Adaptation) models for character design variation to avoid retraining large foundations from scratch.

Avoid systematic use of generative tools

Implement editorial guidelines that limit AI usage to specific production stages where it offers clear value (e.g., prop design iterations, layout exploration).

> For example, at Blue Zoo (UK), AI is only used to support early moodboarding, not for final asset creation. This avoids overproduction, redundant outputs, and unnecessary carbon consumption.

Moreover, a traditional script or tool will always be significantly more energy efficient than an AI model performing the same task. For instance, for color correction, animation interpolation, key-framing, resizing, or automation scripts. Wherever possible, these conventional solutions should be prioritized before turning to AI-based alternatives.

Pool infrastructure when possible

Use shared render or inference servers across departments, or even studios, to avoid over-equipping individual artists with high-performance GPUs.

> In Germany, collaborative clusters supported by Filmförderung Hamburg Schleswig-Holstein allow small and mid-size animation teams to access shared infrastructure with central monitoring.

Use AI tools that disclose their energy use or training practices

Whenever available, select models or platforms that publish details on their training datasets, energy consumption, or hardware specifications. The platform Hugging Face now includes a "carbon emissions" estimate on certain model pages.

> Some animation teams using AI for automatic in-betweening (e.g., DAIN or RIFE) cross-reference these data to select tools with lower inference costs.

→ see next page

Document the AI tools used in the production pipeline

For transparency and legal compliance (e.g., in the EU, under the forthcoming AI Act), track what generative tools are used, when, and how.

> Ulysses Filmproduktion (Germany) now includes a short "AI traceability appendix" in production reports for broadcasters, listing any generated content, software used, and final human validation.

Set clear guidelines on copyright and AI-generated content

Studios working internationally should define internal policies on using AI-generated assets, particularly regarding copyright risks when models are trained on unlicensed content.

> In the United States, Netflix Animation has adopted a clear policy: no use of third-party AI models trained on datasets without documented rights clearance.

Ensure human validation in all critical creative decisions

AI tools should assist, not replace, core artistic judgment.

> The Italian studio Movimenti Production uses AI to explore lighting setups and layout angles, but directors always make the final selection. Embedding a review step into the pipeline reinforces both quality and ethical responsibility.

Train artists and technical directors on sustainable AI use

Training is essential to avoid misuse and to help teams understand the limitations, energy cost, and risks of generative AI.

> In Spain, the Catalonia Film Commission (ICEC) recently launched a pilot workshop series on AI ethics and energy consumption in animation, co-developed with Universitat Politècnica de Catalunya.

Join collective initiatives for responsible AI

Studios can join international working groups or sectoral observatories that share benchmarks, ethical codes, and infrastructure access.

BUILDINGS AND OFFICES

PART 1/6

Number of sheets : 14

SUMMARY SHEET

BUILDINGS AND OFFICES

Introduction

The climate crisis requires urgent changes across every sector, and the built environment is no exception. Buildings account for 34 percent of global CO_2 emissions and 32 percent of energy use worldwide, according to the United Nations Environment Programme (UNEP). This impact stems both from the materials used in construction (such as cement and steel, responsible for 18 percent of global emissions) and from the way buildings are operated on a daily basis.

Within the European Union, the building sector is responsible for over 35 percent of the total waste generated and approximately 5 to 12 percent of greenhouse gas (GHG) emissions. The construction and renovation of buildings require large volumes of extracted materials (around 50 percent of global extraction) making resource efficiency and reuse essential. According to the European Commission, improved material efficiency alone could cut 80 percent of emissions linked to the construction sector.

In the animation industry, these issues are especially relevant for studios managing office spaces, production floors, and creative infrastructures. While illustrators or animators may not directly influence building decisions, every team member can support or relay sustainable initiatives, particularly in studios with internal dialogue groups or environmental task forces.

This section of the guide is designed for professionals in charge of real estate, studio management, operations, production coordination, human resources, or sustainability strategies. It provides concrete and operational recommendations to reduce the environmental impact of buildings across three core dimensions:

- **Construction and rehabilitation** (fact sheets 1, 2, 3): focus on renovation, insulation, and space optimization to limit material use and land footprint.
- **Energy performance** (fact sheets 4, 5, 6, 7, 8): from heating and cooling to lighting, these actions help reduce consumption and transition to low-emission energy sources.
- **Everyday office activities** (fact sheets 9, 10, 11, 12, 13): procurement, printing, waste management, and water use also play a role in limiting operational impact.

SHEET 1

Prefer renovation over construction

Findings

Priority

Difficulty

Financial gain

Renovating existing buildings significantly reduces environmental impact compared to new construction, primarily due to lower embodied carbon emissions.

In Sweden, a study comparing renovation and new-build scenarios found that renovating an existing building resulted in 55% lower embodied carbon emissions: 352 $kgCO_2e/m^2$ versus 785 $kgCO_2e/m^2$. In the United Kingdom, research indicates that the embodied carbon associated with new construction is, on average, twice that of a deep retrofit. In Denmark, new regulations introduced in 2023 limit both operational and embodied carbon emissions to 12 kg CO_2e/m^2/year for all new buildings, demonstrating a firm national commitment to reducing construction-related emissions. Meanwhile, in the United States, analysis shows that retrofitting existing buildings can emit 50% to 75% less carbon than constructing a new building of equivalent size and function.

Levers

Engage sustainable design professionals

Collaborate with architects and construction professionals who specialize in sustainable design and renovation. Their expertise ensures the integration of eco-friendly materials and energy-efficient systems, aligning with best practices in sustainable development.

Select accessible locations

Choose studio locations that are easily reachable by public transport, cycling, or walking. This helps reduce emissions associated with commuting and promotes healthier, low-impact mobility.

Promote active mobility

Provide secure bike parking, showers, and locker rooms to encourage active transportation. Consider offering incentives or subsidies for employees who cycle or walk to work.

→ see next page

Sheet 1. Prefer renovation over construction

Good to know

Several countries offer financial assistance to support sustainable renovation projects in the professional and cultural sectors.

In Germany, the Federal Funding for Efficient Buildings – Non-residential Buildings (BEG NWG) scheme provides up to 50% in subsidies for the renovation of offices, studios, or production spaces. Eligible improvements include enhanced insulation, high-efficiency heating systems, and renewable energy integration.

In the Netherlands, the Energy Investment Allowance (EIA) allows businesses to deduct up to 45.5% of investment costs related to energy-saving equipment or sustainable building upgrades. This includes insulation materials, efficient HVAC systems, and smart energy management technologies.

These public programs (similar in many countries) significantly reduce the financial barriers to renovation, making sustainable upgrades more accessible for animation studios and other cultural production facilities.

SHEET 2

Insulate your offices

Findings

Heating and cooling represent a major share of energy use in commercial buildings, with heating alone accounting for around 50% of typical office energy expenses. Adequate insulation can drastically reduce the need for active heating or cooling. In Germany, the BEG subsidy program covers up to 50% of the costs related to insulation and other energy-saving renovations. In the Netherlands, the Energy Investment Allowance lets companies deduct 45.5% of qualifying investments in thermal insulation or other improvements. In France, although the MaPrimeRénov' program targets homeowners, it reflects broader national efforts to reduce emissions through renovation.

Priority

Difficulty

Financial gain

Levers

Insulate the building envelope

Reinforce roofs, walls, and floors to reduce heat loss in winter and heat gain in summer. Exterior insulation increases both efficiency and the durability of the building.

Seal openings and improve glazing

Check and seal doors and windows to prevent drafts. Use double or triple glazing, shutters, or thick curtains. In winter, shutters can reduce window-related heat loss by up to 60%.

Implement solar protection measures

Use blinds or solar-reflective films on windows to reduce heat gain. These solutions help maintain thermal comfort while limiting the need for cooling.

> **Good to know:**
>
> In the United States, the Energy-Efficient Commercial Buildings Deduction (Section 179D) allows building owners to deduct up to 1 dollar per square foot for improvements to the building envelope. In Germany and the Netherlands, the same programs that support BMS also apply to insulation upgrades. These incentives help offset the initial investment for studios aiming to reduce long-term energy costs.

SHEET 3

Optimize workspace

Findings

Animation studios typically experience fluctuating activity throughout production cycles, leading to underused workspaces during quieter periods. Remote and hybrid work trends have amplified this pattern. A study in Norway showed that flexible office use, including hot-desking, can lower energy use by up to 30% by reducing unnecessary heating, lighting, and cooling. In Germany, occupancy-based controls delivered energy savings of up to 20%. In the UK, many companies have reduced their real estate footprint and shifted to shared or flexible offices, cutting costs and emissions.

Priority

Difficulty

Financial gain

Levers

Optimize space utilization

Adapt layout and usage patterns to reflect actual needs. Shared workstations, rotation planning, and compact design reduce the space required.

Partition offices

Divide spaces into separately heatable or coolable zones to avoid conditioning unused areas.

Share premises

Studios with surplus space can rent or co-share with other companies. This approach maximizes efficiency and fosters collaboration.

> **Good to know:**
>
> Different remote work setups have varying effects on space and energy use. Occasional remote work leaves dedicated spaces unused, which can be inefficient. Flex-office models, where desks are shared, improve space efficiency. Fully remote work eliminates the need for individual workstations altogether, offering maximum energy savings when well implemented. Studios adopting such models should ensure employees have energy-efficient setups at home.

SHEET 4

Measure and manage building consumption

Findings

Effective management of energy consumption in buildings requires the ability to measure, analyze, and optimize parameters such as temperature, lighting, and air quality. In Norway, a pilot project in Vestfold and Telemark County used an Energy Management System to monitor weekly energy patterns and achieved significant consumption reductions through real-time adjustments. In the United States, the installation of an AI-driven control system at 45 Broadway in New York resulted in a 15.8% reduction in HVAC energy use, cutting 37 metric tons of CO_2 emissions annually. A study by the U.S. Department of Energy found that advanced building control systems can lower energy consumption by 5% to 20% by addressing inefficiencies. In Greece, an IoT-based system reduced peak-hour energy demand by up to 86% in a residential case study, illustrating the potential for smart monitoring in professional spaces.

Priority

Difficulty

Financial gain

Levers

Train responsible building users

Provide training for studio managers, HR staff, and technical directors on responsible energy use. Focus on temperature settings, natural lighting, and ventilation systems to improve building performance.

Inform users of habit changes

Encourage behavioural shifts such as lowering thermostat settings, using blinds or shutters to control sunlight, and turning off unused equipment. Communicate clearly to balance comfort and savings.

Implement a Building Management System (BMS)

Adopt a BMS to centralize control over heating, cooling, ventilation, and lighting. Larger studios may delegate this to the technical or HR department, while smaller studios can involve external experts. Advanced systems allow real-time adjustment and energy optimisation, but must be properly configured and maintained to avoid inefficiencies.

Good to know

Several public schemes support the installation of energy management systems. In Germany, the Federal Funding for Efficient Buildings program includes grants for technologies like BMS. Finland's Business Finland initiative funds companies investing in smart energy systems. The Netherlands allows companies to deduct a substantial portion of their investment in energy-saving equipment, including BMS, under the Energy Investment Allowance.

SHEET 5

Replace gas or oil heating with lower-emission systems

Findings

According to the French Agency for Ecological Transition (ADEME), a natural gas boiler emits 30 percent more greenhouse gases than standard electric heating, 10 to 30 percent more than district heating depending on the fuel used, and 4.5 times more than a heat pump. Oil heating emits over ten times more than natural gas. Complementary data from the European Climate Foundation highlights that heat pumps are up to four times more efficient than gas boilers and cost approximately 30 percent less to operate over their lifetime. Research from the Royal Institution of Chartered Surveyors (RICS) also indicates that switching to district heating can reduce annual emissions by up to 3.2 times compared to gas boilers, depending on the energy mix.

Priority

Difficulty

Financial gain

Levers

Replace gas or oil heating with a heat pump

Heat pumps recover thermal energy from one environment and transfer it to another. For example, an air-water heat pump draws heat from outside air and transfers it to the heating system. Key considerations include:

- Appropriate system sizing
- High-performance insulation, which is essential for maintaining efficiency
- Preference for water-water systems in suitable locations due to higher thermal conductivity
- Thermal insulation of equipment to avoid heat loss and protect from freezing
- Regular maintenance to ensure durability and performance

Connect to a district heating network

These centralized systems supply heat from various sources including natural gas, biomass, or industrial waste heat. When the local network includes a significant share of renewable or recovered energy, connection can significantly lower emissions.

Consider installing solar thermal systems

Solar panels can supplement heating needs and reduce dependence on fossil fuels, especially when combined with proper insulation and smart heating controls.

Good to know

Several countries offer support for transitioning away from fossil-fuel heating. In Germany, the Federal Subsidy for Efficient Buildings (BEG) offers up to 50 percent funding for low-emission systems including heat pumps. In the United Kingdom, the Boiler Upgrade Scheme provides grants of up to £7,500 for installing heat pumps or low-carbon systems.

SHEET 6

Lower heating

Findings

Priority

Difficulty

Financial gain

Reducing indoor temperatures is a simple and effective way to lower energy use. According to the French Agency for Ecological Transition (ADEME), reducing indoor temperature by 1°C can decrease energy consumption by 7 percent in standard buildings and up to 10 to 15 percent in well-insulated ones. The UK Health and Safety Executive recommends a minimum indoor workplace temperature of 16°C, or 13°C for physically demanding tasks. A study from the University of Dundee also confirms that reducing heating by 1°C can lead to fuel savings of 5 to 8 percent.

However, this measure is not universally applicable. Setting indoor temperatures to 19°C may be realistic in temperate and oceanic climate regions, such as France, Germany, the United Kingdom, the Netherlands, Belgium, Italy, and parts of Spain. In addition, it is generally feasible in Scandinavian countries like Sweden, Denmark, and Norway due to the high energy efficiency of buildings and cultural adaptation to cooler indoor climates.

By contrast, in colder continental or mountainous areas such as Poland, the Czech Republic, Slovakia, Romania, and large parts of the Baltics, the same approach might require stronger building insulation and more robust heating systems to maintain thermal comfort. In extreme cold climates like Finland or northern parts of Canada, lowering indoor temperature targets may not be advisable without high-performance envelopes and supplementary heating strategies. The applicability of this measure should therefore be assessed based on local climatic and regulatory conditions.

Levers

Set heating to a maximum of 19°C (or as prescribed by law)

Before implementing this measure, communicate with employees and consider providing blankets or warmer clothing options. Thermometers can help raise awareness and monitor indoor conditions effectively.

Implement night-time temperature setbacks

Lower heating settings during unoccupied hours to avoid unnecessary consumption. A heating technician can help configure the system safely and efficiently.

Ensure radiators are unobstructed

Keep furniture, storage units, or equipment away from radiators to ensure even and effective heat distribution throughout the workspace.

SHEET 7

Limit office air conditioning

Findings

Air conditioning can represent up to 20 percent of electricity use in office buildings, especially in warmer regions or poorly insulated spaces. Most systems rely on fluorinated gases, which have a global warming potential several thousand times higher than CO_2. According to the International Energy Agency (IEA), improved passive design and ventilation can reduce cooling needs by up to 80 percent in temperate regions. A study by the European Solar-Shading Organization (ES-SO) found that installing solar protections on 75 percent of windows in renovated buildings can reduce annual energy consumption and emissions by up to 19 percent. In very hot climates, passive measures may need to be complemented by selective use of mechanical systems.

Priority

Difficulty

Financial gain

Levers

Avoid or reduce air conditioning use

Use solar shading, insulating window films, and fans to improve indoor comfort while reducing energy demand.

Offer flexible working hours

Let employees start earlier during heatwaves to reduce exposure to peak indoor temperatures.

Use thin clients

Replace desktop machines with centralised systems to reduce local heat output (see infrastructure section).

Optimize mechanical ventilation

Install variable-speed fans, CO_2 sensors, and double-flow systems with heat recovery. Ensure regular system maintenance.

Implement free cooling

Use night or early-morning natural ventilation when outside air is cooler than indoor conditions. This strategy is effective when external temperatures remain below 35°C.

Consider connection to an urban cooling network

Where available, these systems use river water or industrial recovery to deliver chilled air with lower carbon impact. Their feasibility depends on local infrastructure.

Good to know
Indoor air pollution

Overheated and poorly ventilated offices can have poor air quality. Common sources of indoor pollution include human respiration (CO_2), cleaning products, paints, and markers. Regular ventilation and certified air quality sensors can help monitor and manage pollutants such as CO_2, VOCs, and fine particles.

SHEET 8

Install LED bulbs and adaptive lighting systems

Findings

LED technology is one of the most accessible and cost-effective solutions for reducing electricity use in office environments. A low-consumption LED bulb uses only 20 to 25 percent of the energy of an incandescent bulb and lasts six to ten times longer. In Canada, according to Natural Resources Canada, lighting accounts for approximately 12 percent of energy use in office buildings, and retrofitting with LED systems can bring immediate and measurable energy savings. In Australia, the Department of Industry, Science, Energy and Resources reports that lighting can represent up to 40 percent of electricity consumption in commercial premises. A series of case studies published by the Australian company Enlighten Australia demonstrated that LED retrofits in commercial buildings can achieve energy savings ranging from 70 to 93 percent.

Priority

Difficulty

Financial gain

Levers

Replace incandescent bulbs with LEDs

As bulbs burn out, systematically replace them with LED alternatives. This reduces both energy consumption and the frequency of maintenance.

Position desks near windows

Place workstations close to natural light sources to reduce the need for artificial lighting during daylight hours.

Install presence detectors

Use motion sensors in areas such as hallways, meeting rooms, and restrooms to ensure lights are only on when needed.

Install brightness sensors

Daylight sensors help maintain consistent lighting levels throughout the day by adjusting artificial light output based on natural light availability.

Implement automatic lighting systems

Programmed on/off schedules or centralized lighting management systems help avoid unnecessary usage, especially outside working hours.

→ see next page

Sheet 8. Install LED bulbs and adaptive lighting systems

Good to know

Various countries offer public incentives to encourage lighting upgrades. In Brazil, municipal programs and public-private partnerships have demonstrated that LED implementation in public and commercial buildings can reduce lighting energy use by over 60 percent. In Japan, LED installations are eligible for subsidies under several national energy efficiency schemes managed by METI. In the United States, many state-level utility programs offer rebates or tax credits for ENERGY STAR certified LED lighting in commercial environments. These supports facilitate the transition toward efficient lighting systems for animation studios and other cultural production spaces.

SHEET 9

Favor second-hand furniture

Findings

Priority

Difficulty

Financial gain

Opting for second-hand furniture is an effective strategy to reduce the environmental impact of furnishing workspaces. According to the European Environmental Bureau, over 10 million tonnes of furniture are discarded annually in the EU, with 80 to 90 percent ending up in landfills or incinerated. A study by the Royal Institute of Technology in Sweden highlights that purchasing second-hand furniture can significantly lower greenhouse gas emissions by avoiding the production of new items and reducing waste. In the Netherlands, government research emphasizes that eco-designed furniture (crafted from recycled or certified materials) facilitates reuse and recycling, thereby supporting circular economy objectives.

Levers

Purchase second-hand furniture

Acquiring pre-owned furniture extends the lifespan of products, reduces demand for new raw materials, and minimizes energy consumption associated with manufacturing and transportation.

Opt for sustainably designed furniture

When new purchases are necessary, select furniture made from recycled materials or certified sustainable sources, such as those bearing the FSC (Forest Stewardship Council) or Cradle to Cradle certifications, to ensure lower environmental impact.

Engage in furniture reuse programs

Participate in or establish programs that facilitate the donation, resale, or refurbishment of office furniture, thereby promoting a culture of reuse and waste reduction within the organization.

SHEET 10

Ensure proper sanitary facilities functioning

Findings

Many toilets and taps leak... and there is no one to fix them! A single dripping tap can waste about 120 liters of water a day. A toilet flush uses 6 to 12 liters of potable water per use, totaling 3,500 to 3,800 liters per person annually. About 600 liters of water are wasted daily by a leaking toilet, equivalent to a family of four's daily consumption. Additionally, taps often run excessively and are too hot.

Priority

Difficulty

Financial gain

Levers

Ensure proper equipment and maintenance of sanitary facilities

Quickly detect and repair any toilet flush leaks.

Equip toilets with dual-flush systems. Installing dual-flush systems can significantly reduce water consumption.

Ensure the proper functioning of the taps

Repair water leaks promptly.

Equip all faucets with aerators, which mix air with water to reduce flow while maintaining pressure.

Fit a pressure relief valve on the water inlet (saves water and protects the plumbing system).

Lower your hot water temperature

You can lower the temperature of your hot water tank. Ask the person who installed your hot water tank to set it to the lowest setting (if no one showers at the office).

Collect rainwater

If possible, install a rainwater harvesting system to supply water for toilets and cleaning tasks, reducing potable water usage.

SHEET 11

Print only what is necessary, in eco mode, and on recycled paper

Findings

While printing less is a visible and positive gesture, its impact remains limited compared to other actions. For perspective, producing 1 kg of beef emits as much CO_2 as over 22,000 sheets of paper. Nonetheless, paper manufacturing still contributes to pollution and resource depletion. According to the World Wide Fund for Nature (WWF), recycled paper uses six times fewer chemicals and 25 times less fresh water than virgin paper. In animation studios, printing is often limited to HR documents (contracts, payslips) or annotated storyboards. In both cases, dematerialisation and eco-printing practices are strongly encouraged.

Priority

Difficulty

Financial gain

Levers

Use electronic signatures

Adopt secure digital signature tools for contracts, legal documents, and approvals in production workflows.

Clean up digital storage

Regularly delete redundant or outdated files from shared drives and server folders. This helps optimize server performance and reduce energy use.

Set printers to eco mode

Activate draft mode and black-and-white printing as default. Enable automatic double-sided printing to save paper.

Use recycled and certified paper

Choose paper with labels like Blue Angel, EU Ecolabel, Nordic Swan or FSC. Avoid PEFC if stricter standards are preferred.

> **Good to know**
>
> Recycled paper can be reused up to seven times. Set up a dedicated tray for single-sided sheets to be reused for notes or internal drafts. In shared studios, clearly label collection bins and post reminders near printers. Use ink-saving fonts like Ecofont, increase margins, and avoid heavy graphics or white-on-black layouts. If possible, implement user quotas on shared printers to monitor consumption and promote mindful habits.

SHEET 12

Implement waste sorting, especially for bio-waste

Findings

Waste sorting is a simple and visible action that reinforces an organisation's environmental commitment. In the European Union, all Member States are required to provide a separate collection of bio-waste from 2024. In France, municipalities must implement local systems. Germany already composts or transforms over 60 percent of bio-waste into biogas through established municipal services. These approaches are adaptable to professional contexts. In animation studios, which generate limited but diverse waste (kitchen, paper, batteries, electronics), an efficient sorting system supports broader sustainability goals.

Priority

Difficulty

Financial gain

Levers

Assign a point person

Designate someone to oversee sorting and composting logistics. Worm composting, suitable for small indoor spaces, requires only minimal daily maintenance.

Sort kitchen and bio-waste

Provide composters for staff with garden access. In urban studios, explore indoor compost solutions or propose shared composting through the building manager.

Sort all waste streams

Install clearly marked bins for paper, plastics, glass, batteries, coffee capsules, and electronic consumables (like toner). Partner with certified recycling services to ensure proper handling.

Good to know

White paper can often be resold to recyclers if clean and flat. To encourage reuse, add a tray for single-sided sheets labeled "Draft Use Only". Post clear sorting guidelines near bins and regularly remind teams during internal briefings. In shared kitchens, offer bean or ground coffee to avoid capsule waste, or ensure capsules are properly collected. Always dispose of batteries and lamps through specialist channels, not general waste.

SHEET 13

Implement a responsible purchasing policy

Findings

An animation studio's main suppliers include IT equipment vendors, software and service providers and energy suppliers. The carbon impact of these partners, known as emission factors, is part of your own footprint. It is essential to engage them in your decarbonization strategy, and to consider switching suppliers if their practices are not aligned with your goals.

Priority

Difficulty

Financial gain

Levers

Include environmental criteria in purchasing decisions

Integrate sustainability requirements into procurement processes and contracts. Refer to local or sector-specific responsible purchasing guides.

Engage suppliers on their environmental commitments

Request information about their emission factors and encourage measurable sustainability efforts. Choose partners aligned with your environmental standards.

SHEET 14

Host your website with a green host

Findings

Website hosting contributes to greenhouse gas emissions through the energy required to power, cool, and maintain servers and data centers. While often overlooked, the choice of hosting provider directly affects the environmental footprint of digital operations. Servers located in carbon-intensive regions or running on inefficient infrastructure can significantly increase emissions. Opting for a provider committed to energy efficiency and low-carbon electricity is a simple yet effective lever for emission reduction.

Priority

Difficulty

Financial gain

Levers

Choose data centers with verified sustainability performance

Prioritize hosting services with a Power Usage Effectiveness (PUE) below 1.5, and that rely on renewable or low-carbon electricity. Look for international certifications such as ISO 14001 (environmental management) and ISO 50001 (energy efficiency).

Avoid greenwashing through third-party validation

Select providers with transparent, externally verified sustainability claims. Avoid vague marketing language that lacks measurable indicators or independent audits.

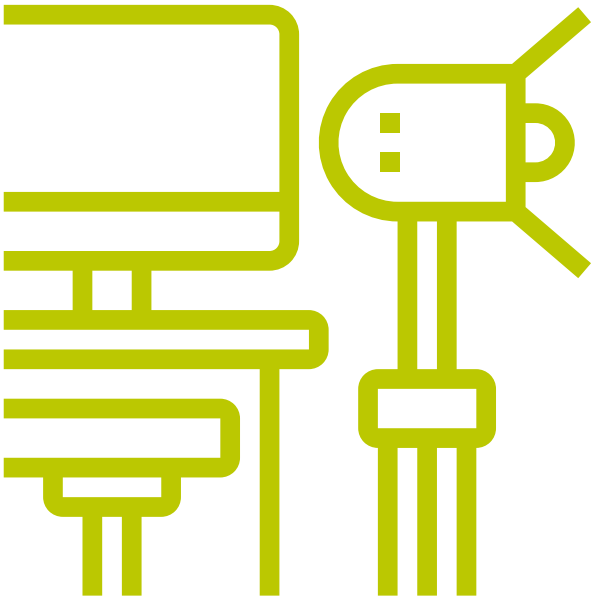
Prefer providers with a proven environmental track record

Examples of hosting companies recognized for their environmental practices include Infomaniak (Switzerland), Hetzner (Germany), and GreenGeeks (United States). Many other local or cooperative alternatives may also meet rigorous sustainability criteria.

STUDIO INFRASTRUCTURE

PART 2/6

Number of sheets : 8



SUMMARY SHEET

STUDIO INFRASTRUCTURE

Introduction

Animation studios are highly dependent on digital infrastructure. From hardware and render servers to cloud-based storage and network connectivity, these systems are essential to creative and technical production, but they are also major sources of greenhouse gas emissions. In fact, across the animation pipeline, much of a studio's environmental footprint originates not from what is seen on screen, but from what powers its creation.

Reducing this impact does not mean compromising creative ambition or technological performance. It means aligning production practices with energy efficiency, equipment longevity, and informed digital governance. Whether a studio is small or large, local or international, many solutions are already available, and scalable.

The goal is not a perfect infrastructure, but a responsive one, able to meet the needs of each production while minimizing its footprint through better knowledge, shared responsibility, and long-term strategy.

SHEET 1

Avoid double equipment and manage power on/off

Findings

Priority

Difficulty

Financial gain

Teleworking has expanded significantly since the COVID-19 pandemic. According to a 2023 report by the McKinsey Global Institute, remote or hybrid work models have stabilized at around 20 to 25 percent of all working days in countries such as the United States, Canada, and the United Kingdom. In the U.S., the U.S. Census Bureau indicates that commuting by private car still represents over 75 percent of home-to-work travel, highlighting the potential emissions reduction from fewer commutes.

Environmental gains from teleworking are clear under certain conditions. A 2023 study published in the Proceedings of the National Academy of Sciences found that full-time remote work can reduce carbon footprints by up to 54 percent, while hybrid arrangements (two to four days per week) achieve reductions of 11 to 29 percent. However, the study also notes that these savings vary significantly depending on regional transportation habits and the energy performance of homes.

In animation studios, the benefits of remote work can be partially offset if it results in duplicated equipment. Maintaining one workstation at the studio and another at home increases energy consumption and material use. Moreover, if the office equipment remains powered during remote working days, overall emissions may increase instead of decrease.

→ see next page

Sheet 1. Avoid double equipment and manage power on/off

Levers

Equip with thin clients

Thin clients are lightweight terminals that connect to a centralized server hosting the user's software environment. They consume significantly less power (typically 15 to 50 watts per hour) compared to a standard desktop workstation, which averages around 85 watts per hour. Thin clients reduce internal heat emissions, lower cooling demand, and allow for flexible desk sharing or hot-desking. They are particularly suited to animation pipelines that rely on centralized storage and rendering resources, and they can help reduce the need for duplicated setups between home and studio.

Implement remote startup systems (Wake-on-LAN)

Wake-on-LAN allows IT teams to remotely power on workstations over a wired network. This ensures machines are only active when required, preventing unnecessary energy use during evenings, weekends, or remote workdays. This system also facilitates secure access to in-studio hardware from offsite locations.

Automate shutdown of office equipment

Powering down monitors, lights, and unused computers during off-hours is a simple and effective measure. Automation systems linked to building security or scheduling software can help reduce standby energy consumption. For studios with server rooms or render nodes, the automation should be layered to keep critical infrastructure running while minimizing auxiliary load.

> ### Good to know
>
> Thin clients may not suit all tasks in animation. While they work well for tasks involving 2D work, scripting, or asset browsing, their limitations in latency and multi-screen support can impact real-time review, compositing, or high-frame-rate playback. When investing in thin client architecture, studios should assess the operational balance between centralized performance, remote access needs, and energy efficiency.
>
> By carefully managing equipment use and reducing duplication, studios can support hybrid work without compromising their climate goals. These actions, combined with broader infrastructure planning, contribute to meaningful reductions in operational emissions.

SHEET 2

Choose labeled equipment

Findings

When reuse is not an option, selecting IT and office equipment with verified environmental certifications helps reduce emissions and supports responsible sourcing. Environmental labels assess multiple criteria such as energy efficiency, material use, repairability, and end-of-life management.

TCO Certified, developed in Sweden, is one of the most comprehensive sustainability certifications for IT products, covering social and environmental criteria across the product life cycle. EPEAT, maintained by the Global Electronics Council, evaluates products based on energy use, recyclability, and manufacturer practices. The ECMA-370 Eco Declaration is a standard used by manufacturers to disclose environmental information for IT products, particularly in Europe.

These labels are widely used by major manufacturers and recommended in institutional procurement frameworks, including those relevant to education, creative industries, and public tenders.

Priority

Difficulty

Financial gain

Good to know

Certifications such as TCO and EPEAT are designed to support professional procurement processes and are compatible with the operational needs of animation studios. They can also improve long-term cost efficiency through better energy performance and lower maintenance demand. Choosing certified equipment contributes to reducing the environmental footprint of studio infrastructure while encouraging manufacturers to meet higher standards.

Levers

Prioritize certified equipment

When purchasing new devices, prioritize models registered with internationally recognized certifications such as TCO Certified, EPEAT (preferably Gold level), or ECMA-370. These labels indicate compliance with minimum environmental performance standards.

Use product directories

Refer to certified product databases and ecolabel registries to guide procurement. These tools help identify models that meet energy and sustainability benchmarks.

Include environmental criteria in supplier dialogue

Ask suppliers for certification documentation and integrate sustainability criteria in technical specifications, particularly for workstations, monitors, and server infrastructure.

SHEET 3

Adapt render server computing power to the load

Findings

Priority

Difficulty

Financial gain

Render servers are among the most energy-intensive assets in animation studios. When left running at full capacity regardless of actual needs, they cause unnecessary electricity consumption and greenhouse gas emissions. Technologies like Intel SpeedStep and AMD Precision Boost allow processors to scale power use in real time, depending on workload.

According to the U.S. Department of Energy's Lawrence Berkeley National Laboratory, adapting server operations to workload demands can reduce data center electricity use by up to 20 percent. In response, many studios now combine in-house render farms with external rendering services to manage peak activity without maintaining oversized infrastructure year-round.

Levers

Adjust server power to workload

Enable dynamic CPU scaling to reduce energy use during periods of low render demand.

Automate idle shutdown

Configure render nodes to power down or enter low-energy states when inactive, reducing both electricity and cooling loads.

Outsource peak rendering

Use external render farms for overflow or irregular workloads. These services often operate with higher server utilization rates and optimized energy use, especially beneficial for studios with limited internal resources. Ask your provider about its environmental policy, such as using renewable energy, implementing energy-efficiency measures or optimizing hardware and software setups.

> ### Good to know
>
> Cloud render providers typically refresh hardware more often, maintain high server occupancy, and in some cases use renewable energy. This makes them an efficient and lower-emission option when used strategically in combination with in-house rendering.

SHEET 4

Ensure energy-efficient server room cooling

Findings

Priority

Difficulty

Financial gain

Cooling systems can account for up to 40 percent of a data center's electricity consumption. Poor sizing, lack of maintenance, and inefficient airflow management often lead to overconsumption, refrigerant leaks, and higher greenhouse gas (GHG) emissions.

ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) recommends operating server rooms between 18°C and 27°C to optimize performance and energy use. Studies by the Uptime Institute and the EU Joint Research Centre show that proper layout (hot/cold aisle containment) and adjusted temperature setpoints can reduce cooling energy demand by 20 to 40 percent.

However, conditions vary significantly across regions. In colder climates like Norway or Sweden, free cooling, using outside air to cool servers, is often viable and highly effective. In contrast, in warmer or more humid regions, such systems may be technically limited. Carbon intensity of electricity is another factor: Norway emits under 20 gCO_2/kWh due to hydropower, while parts of Eastern Europe exceed 400 gCO_2/kWh. This means inefficient cooling in carbon-intensive regions has a far greater environmental impact.

Studios may operate their own server rooms, rent colocation space, or rely entirely on cloud services. In outsourced setups, direct control over cooling may be limited, but studios can still request transparency on energy use and emissions in service contracts.

Levers

Optimize infrastructure

- Use hot/cold aisle separation or containment systems to improve airflow and reduce cooling demand.
- Insulate server rooms and limit airflow leaks.
- Choose cooling systems aligned with server load and room configuration.
- Prefer equipment certified under ASHRAE or the EU Code of Conduct for Data Centres.

Optimize operations

- Set temperature targets to 24°C or higher where feasible.
- Schedule regular maintenance to avoid refrigerant leaks and dust-related inefficiencies.
- Use free cooling systems where climate permits, and variable-speed fans to adjust airflow in real time.

→ see next page

Sheet 4. Ensure energy-efficient server room cooling

Good to know

Thin clients may not suit all tasks in animation. While they work well for tasks involving 2D work, scripting, or asset browsing, their limitations in latency and multi-screen support can impact real-time review, compositing, or high-frame-rate playback. When investing in thin client architecture, studios should assess the operational balance between centralized performance, remote access needs, and energy efficiency.

By carefully managing equipment use and reducing duplication, studios can support hybrid work without compromising their climate goals. These actions, combined with broader infrastructure planning, contribute to meaningful reductions in operational emissions.

And tomorrow? AI, cloud and shared infrastructures

Artificial intelligence is increasingly used to improve energy efficiency in data centers, especially for predictive cooling. Some facilities integrate real-time workload forecasts into their temperature regulation systems to minimize unnecessary cooling and ensure stable thermal conditions. This helps reduce energy peaks and extends equipment lifespan.

For studios relying partly or entirely on the cloud, it is essential to evaluate the environmental footprint of outsourced infrastructure:

Understand your cloud architecture: Public cloud services rely on shared infrastructure and generally benefit from high server utilization rates. Private clouds, by contrast, may involve dedicated servers with lower energy efficiency.

Assess data dispersion and redundancy: Identify where and how data is stored, particularly when spread across multiple platforms or vendors. Consider consolidating storage and streamlining data flows to avoid duplication and reduce energy costs.

In Europe, several providers are recognized for their sustainability efforts:

Google's Saint-Ghislain campus in Belgium uses solar energy and recycled industrial water for cooling, supported by AI systems for predictive energy management.

Infomaniak in Switzerland operates entirely on hydroelectric power and follows strict environmental and social responsibility criteria.

OVHcloud in France has developed a closed-circuit water-cooling system that drastically limits water withdrawal while maximizing free cooling.

Good to know

Choosing between internal data rooms and cloud infrastructure depends on multiple factors: access to real estate, control needs, budget, and technical skills. In-house solutions offer fine-tuned control over energy use, while cloud models provide flexibility and scalability. Some studios opt for hybrid approaches or shared sovereign data centers to balance efficiency, resilience, and sustainability.

SHEET 5

Use climate-adapted cooling solutions

Findings

Cooling server rooms can be a major source of energy consumption in animation studios. In temperate regions, free cooling systems that use outdoor air instead of mechanical refrigeration can reduce energy use by 50 to 70 percent. However, their effectiveness depends on climate, building design, and local air quality.

In Belgium, Google's Saint-Ghislain data center uses a combination of free cooling, solar energy, and industrial water reuse. In Switzerland, Green Datacenter operates with ambient air cooling for most of the year. In warmer climates, such as the Middle East or Southeast Asia, studios and data centers rely more on efficient liquid cooling and district cooling networks.

Priority

Difficulty

Financial gain

Levers

Evaluate local cooling options

Free cooling is effective where outdoor temperatures remain below 20°C for much of the year. In hotter areas, consider hybrid or network-based solutions.

Improve airflow and containment

Use hot and cold aisle separation, seal air leaks, and maintain stable temperatures to reduce the load on cooling systems.

Choose low-carbon alternatives

In dense or warm regions, connect to district cooling networks or install high-efficiency water-based systems.

Monitor and clarify system performance

Track energy use and verify that systems marketed as "free cooling" meet actual passive ventilation criteria.

> **Good to know**
>
> Free cooling is not universally applicable. Its impact depends on local climate, server density, and the carbon footprint of the electricity used. In all cases, optimizing thermal design and maintenance remains essential for reducing emissions.

SHEET 6

Use a wired network and check connectors

Findings

Wired networks consume less energy than wireless connections like WiFi or 5G, especially when cables are in good condition. Most of their environmental impact comes from manufacturing, not use.

Priority

Difficulty

Financial gain

Levers

Prioritize Ethernet over wireless

If available, use Ethernet connections for workstations and fixed equipment. They are more energy-efficient and offer better bandwidth.

Check cables and connectors

Inspect and replace damaged or aging cables. Poor-quality connections can slow data flow and increase energy consumption.

Good to know

A well-maintained wired network improves performance and reduces emissions, especially in studios with high data traffic and long operating hours.

SHEET 7

Optimize hardware characteristics based on use

Findings

Priority

Difficulty

Financial gain

Studios often acquire high-performance machines by default, regardless of actual needs. This over-equipment leads to unnecessary energy use and a significantly higher manufacturing footprint. According to the German Federal Environment Agency, manufacturing accounts for over 70 percent of a workstation's environmental impact. A study by Fraunhofer UMSICHT found that aligning hardware to actual roles can reduce equipment-related energy use by up to 40 percent.

In France, data from the Cartouch'Verte initiative revealed that many 2D animation stations, used with software like TVPaint, could function without dedicated GPUs, halving their carbon footprint from 190 to 90 kg CO_2e/year when considering both use and manufacturing phases.

Levers

Adapt hardware to production roles

Blue Zoo (UK) segmented workstations based on usage profiles, reserving GPU-equipped machines for heavy 3D tasks while using lighter setups for 2D and pipeline management. Similarly, Tumblehead (Denmark) limits advanced tablets to animation leads, with shared equipment for storyboard teams.

Measure and manage hardware impact

In France, EcoDiag from EcoInfo and IMPACTS Base from ADEME help evaluate equipment emissions. Studios like Illumination and Supamonks also use WeNR and customized Excel tools to match devices to actual performance needs.

Virtualize where possible

Canadian and German studios use Teradici to allow secure remote access to centralized GPU machines, reducing the need for individual high-end setups. French studios like MIAM! and 2 Minutes are testing similar solutions in hybrid pipelines.

Audit software and peripherals

Maintain lean installations tailored to each workstation's purpose. Fatfish Lab's Lagoon tool, used by Supamonks (France), links each machine to an employee and verifies equipment needs in real time.

Be cautious with under-specification

Hardbricks (France), in its study for Supamonks, recommends avoiding excessive reliance on GPUs due to shorter hardware lifespans and upgrade cycles. A hybrid model using optimized blade servers and progressive GPU upgrades is currently preferred.

SHEET 8

Extend equipment use duration and limit new purchases

Findings

Priority

Difficulty

Financial gain

The manufacturing phase of IT equipment generates between 50 and 90 percent of its total greenhouse gas emissions, primarily due to resource extraction, component production, and logistics. According to the French Agency for Ecological Transition (ADEME), manufacturing a typical workstation emits over 150 kg CO_2e, not including screen or peripherals. The European Commission's Joint Research Centre confirms that extending the lifetime of laptops by just two years can reduce their overall carbon impact by 30 percent.

In animation studios, where high-performance equipment is often concentrated in artistic and technical departments, limiting unnecessary renewals is both environmentally and economically beneficial.

Levers

Extend equipment lifespan

French studios in the Cartouch'Verte network (Bourg-lès-Valence) maintain artist and animator workstations for 6 to 8 years, and servers for up to 10 years. They achieve this through: regular software and OS updates, restriction of installed programs to essential tools only, preventive maintenance and performance monitoring, hardware updates (e.g. switching HDDs to SSDs, expanding RAM, replacing fans or tablet screens).

Repurpose and refurbish devices internally

Studios often reassign older machines to roles with lower processing needs (e.g. admin tasks or training). For example, Studio Soi (Ludwigsburg, Germany) reallocates older workstations for use in storyboard or production management departments. Lunanime (Ghent, Belgium) created an internal hardware reuse system, where each upgrade cycle is matched with a reassignment protocol across their departments.

Use refurbished or leased equipment

Using second-hand or reconditioned machines drastically reduces emissions. According to Greenly.earth, leasing refurbished equipment can reduce the associated carbon footprint by a factor of 50 to 75.

→ see next page

Sheet 8. Extend equipment use duration and limit new purchases

Nexus Studios (UK) leases refurbished IT systems through providers like Circular Computing, which supply verified carbon savings per unit, along with warranties and impact certificates. In Canada, animation schools like NAD-UQAC (National Animation and Design Centre, Montréal) partner with local circular economy initiatives to source high-performance refurbished equipment for labs and shared teaching spaces.

Partner with local reuse or recycling networks

Ressourcerie Verte (Romans-sur-Isère, France) is a non-profit organization specialized in collecting, repairing and redistributing electronics and furniture. They work with Cartouch'Verte to implement a local collection system: unused equipment is stored on-site in a dedicated room until a pickup is scheduled, with certification for donation or destruction provided as needed.

In the United States, TechSoup supports creative companies and nonprofits in accessing low-cost refurbished equipment, including professional workstations, through manufacturer-backed programs that certify environmental impact reductions.

Favor repairable equipment

France introduced a "durability index" in 2024 (previously the "repairability index"), which rates IT equipment based on:

- Ease of disassembly,
- Availability of maintenance instructions,
- Accessibility and pricing of spare parts.

This tool helps studios make better procurement decisions. The European Union is currently evaluating a similar harmonized label across member states.

Explore equipment sharing models

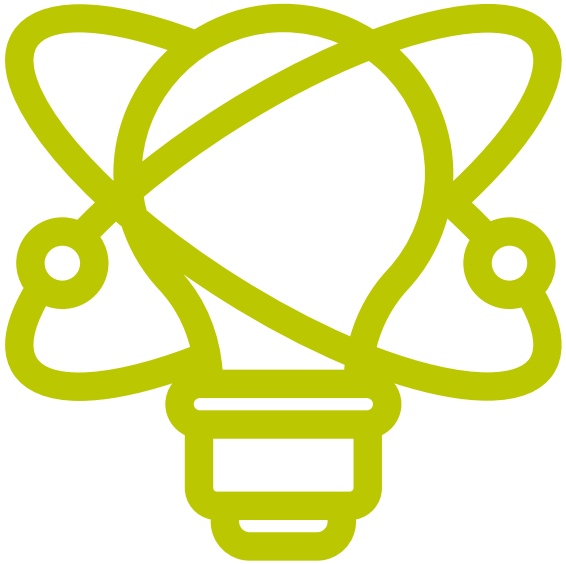
Given that peak usage varies across production cycles, studios can benefit from sharing equipment locally. In Montpellier (France), the OpenProd initiative encourages regional animation companies to pool hardware, render farms, and color grading suites, reducing duplicate investment.

Similar efforts are underway in Québec, where community clusters are experimenting with shared access to rendering infrastructure and virtual production rooms, especially for independent or emerging studios.

WORKFLOW AND PRODUCTION PRACTICES

PART 3/6

Number of sheets : 6



SHEET 1

Reuse assets

Findings

Most graphical assets are not reused between productions due to lack of standardization or proper archiving. Yet reusing assets reduces the need for new modeling, texturing, and rigging, which lowers both workload and emissions. Starting from internal or external asset libraries is a form of digital recycling.

Priority

Difficulty

Financial gain

Levers

Archive assets properly

After production, label and categorize assets with metadata (software version, rig details, purpose). Store metadata in portable formats like JSON or CSV to avoid compatibility issues across systems.

Standardize asset organization

Ensure consistent naming and versioning. Document dependencies, such as required plugins or tools, to ease future reuse.

Use shared libraries and external sources

Explore curated platforms like Unreal Megascans, Texturing.xyz or Adobe Substance. These can reduce production time and emissions, provided they disclose the footprint of their content.

Good to know

Asset reuse is most effective when integrated into production workflows from the start. Establishing internal repositories and clear labeling practices can turn reuse into a long-term efficiency tool for studios.

SHEET 2

Use the USD file exchange standard ?

Findings

Priority

Difficulty

Financial gain

The animation and VFX industries often rely on multiple software platforms that are not fully interoperable. As a result, converting files between proprietary formats can lead to repeated intermediate saves, loss of data fidelity, increased computational demands, and unnecessary energy use. Universal Scene Description (USD), developed by Pixar and released as open source in 2016, proposes a new model for structuring 3D scene data.

Instead of embedding all data within a single, software-specific file, USD organizes assets into modular layers. This enables teams to load only the components needed at any given time, streamlining collaboration, facilitating data exchange, and potentially reducing environmental impacts associated with redundant computations and file storage.

In recent years, international adoption of USD has expanded significantly. Major studios like Pixar, DreamWorks Animation, and Industrial Light & Magic have integrated USD at the heart of their pipelines. In Europe, the format is gaining traction as well. French studio Superprod, for instance, developed a USD-based pipeline called Flow. According to Marc Dubrois, Head of Pipeline at Superprod, “Using USD allows us greater flexibility in connecting software, facilitates data exchange with partner studios, reduces software lock-in, and enables more agile and parallel workflows.”

Levers

Implement USD-based pipelines thoughtfully

Adopting USD can offer concrete sustainability benefits by reducing redundant processing and improving data efficiency. However, transitioning an existing pipeline to USD can be complex and resource-intensive. Studios should carefully evaluate their production needs, available technical resources, and partners’ compatibility before committing to a full transition.

Favor open standards for interoperability

Beyond USD, the broader movement towards open standards (e.g., OpenColorIO for color management, Alembic for geometry caches) supports longer-term sustainability by avoiding proprietary lock-ins and reducing the need for repeated asset recreation or adaptation.

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Sheet 2. Use the USD file exchange standard ?

Good to know

There is ongoing debate about the real sustainability gains associated with USD. While modular scene management can lead to energy savings, the transition phase often involves significant investments in pipeline development and staff training. Furthermore, USD workflows may initially increase the technical complexity of productions, especially for smaller studios without dedicated pipeline teams.

Sources such as the Academy Software Foundation (which promotes open standards for VFX and animation), as well as case studies from studios like Animal Logic (Australia) and Framestore (UK), indicate that the full environmental benefit of USD depends largely on how efficiently the format is implemented and used.

Ultimately, using open, modular formats like USD can be an important part of building more flexible, efficient, and potentially lower-impact digital workflows, provided they are integrated with a broader strategy of resource optimization and long-term infrastructure planning.

SHEET 3

Measure and reduce electricity consumption of software

Findings

"You can't improve what you don't measure" , this principle applies directly to decarbonizing digital workflows in animation studios. Measuring the energy impact of software and hardware combinations across the production pipeline helps identify high-emission stages and reduction opportunities.

Several international studies show that rendering, simulation, and compositing phases often concentrate the majority of energy use in animation workflows. Energy use can vary significantly depending on workstation configuration, software settings, and rendering methods.

Priority

Difficulty

Financial gain

Levers

Monitor digital energy use

Use monitoring tools to track the energy consumption of specific workflows. Studios can implement APIs like Boavizta (France), or equivalent open-source platforms such as Scaphandre (Europe) or Cloud Carbon Footprint (U.S.), which help track the energy and carbon footprint of cloud and local infrastructure.

Set reduction targets per production stage

Some studios define energy benchmarks by task: for example, capping redundant renders, optimizing simulation loops, or reducing the number of local high-resolution exports. Each department can adopt measurable practices, from lighting to compositing.

Select energy-efficient infrastructure

Favor energy-efficient servers, decarbonized cloud rendering services, or platforms that publicly disclose their carbon intensity. For example, the animation studio Nexus Studios (UK) has publicly communicated its internal efforts to audit the footprint of digital operations and shift to low-emission hosting for rendering tasks.

> **Good to know**
>
> Simple actions, like reducing the number of intermediate saves or consolidating backups, can lead to significant energy savings over time. Formalizing energy objectives in your production pipeline helps align technical and environmental performance.

SHEET 4

Evaluate the relevance of real-time 3D in your pipeline

Findings

Priority

Difficulty

Financial gain

Real-time 3D (RT3D) production, using engines like Unity or Unreal Engine, enables immediate rendering of images and environments. This eliminates the need for traditional render farms, which are often energy-intensive. For some projects, this can reduce rendering energy use by over 90 percent.

A 2022 study by the Carbon Trust shows that in a typical 3D animation workflow, rendering may represent between 30 and 45 percent of the digital energy footprint. Real-time production can greatly reduce this share, provided it replaces rather than duplicates existing workflows.

However, RT3D is not universally applicable. It requires powerful workstations equipped with high-performance GPUs and specific artist profiles. Moreover, current real-time rendering engines may not yet match the image quality standards of pre-rendered cinematic productions, especially for complex lighting, FX or realism.

Usage trends post-COVID-19 show growing adoption of RT3D tools in hybrid pipelines, particularly in North America, the UK, and South Korea, often in series, educational content, or stylized formats. Yet large-scale adoption remains dependent on project type, studio capacity and creative requirements.

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Sheet 4. Evaluate the relevance of real-time 3D in your pipeline

Levers

Reduce render time and emissions

RT3D eliminates overnight rendering and high-capacity render farms. For example, an internal case study at Nexus Studios (UK) showed that switching part of a project to real-time saved over 80 percent of the projected rendering energy. Moreover, by reducing the need for render farms, studios also avoid the environmental footprint associated with the manufacturing and life cycle of unused or underused computers. Manufacturing a single desktop computer generates approximately 262 kilograms of CO2, which often exceeds the operational emissions saved by not using these devices.

Improve production agility

Real-time allows instant visual feedback on scenes, lighting and animation, reducing the number of iterations and interdepartmental back-and-forth. This can speed up approvals and decision-making.

Adapt pipelines and teams

RT3D requires hybrid artist profiles, combining artistic sensibility and technical knowledge of engines. It also needs integration of technical directors capable of optimizing real-time scenes for performance and resource use.

Balance carbon and creative needs

Some projects may require hybrid workflows: using real-time for layout, blocking and validation, and switching to high-quality rendering for final output. Flexibility is key.

A video game example :

Epic Games demonstrated that dynamic resolution adjustment in Fortnite reduced GPU power consumption by up to 36% during gameplay. By adapting rendering demands to scene complexity, real-time 3D pipelines can significantly cut energy use without compromising user experience. the animation studio Nexus Studios (UK) has publicly communicated its internal efforts to audit the footprint of digital operations and shift to low-emission hosting for rendering tasks.

→ see next page

Sheet 4. Evaluate the relevance of real-time 3D in your pipeline

Good to know: the hidden footprint of GPUs

While real-time 3D production promises substantial reductions in rendering-related energy use, its environmental benefits must be evaluated in light of the significant footprint associated with GPU manufacturing. High-end graphics cards, essential for running real-time workflows, embody considerable environmental and geopolitical costs well before they are ever powered on.

The production of a GPU involves the extraction and processing of numerous raw materials, including copper, gold, tantalum, cobalt, and rare earth elements such as neodymium or dysprosium. These materials are often mined in countries where environmental regulations are weak, and where mining activities have been linked to deforestation, water contamination, and local conflicts. The Democratic Republic of Congo, for instance, supplies more than 70 percent of the world's cobalt, an essential component in lithium-ion batteries and high-performance electronics, but the sector is marred by social and environmental concerns, including forced labor and toxic exposure.

Beyond environmental degradation, the geopolitical sensitivity of supply chains adds to the complexity. Rare earth elements are concentrated in a small number of countries, particularly China, which has repeatedly used access to these resources as a strategic lever. This creates vulnerabilities in global production systems, particularly in sectors reliant on constant hardware upgrades, such as digital media and animation.

The manufacturing phase of a high-performance GPU can emit several hundred kilograms of CO_2e per unit, depending on the model and source. For instance, life-cycle assessments from the electronics industry indicate that a single high-end graphics card may account for as much as 300 to 500 kg of CO_2e before first use. This is comparable to the carbon footprint of a short-haul flight or the yearly emissions of a low-energy refrigerator.

Furthermore, these GPUs are often embedded in machines that are upgraded or replaced every 3 to 5 years, reinforcing patterns of planned obsolescence and e-waste generation. In 2021, the United Nations reported that only 17.4 percent of global electronic waste was officially collected and recycled, leaving the vast majority to be incinerated, landfilled, or exported to developing countries with limited recycling infrastructure.

In the context of real-time 3D production, these factors underscore the importance of deploying GPU resources efficiently and responsibly. The environmental gains of switching to real-time workflows may be offset if studios equip every artist with a high-end GPU that remains underutilized. A more sustainable approach involves maximizing usage rates, sharing resources through centralized servers or virtualized infrastructure, and extending equipment lifespans wherever possible.

Ultimately, the move toward real-time 3D must be accompanied by a broader awareness of the material, social, and geopolitical impacts of digital infrastructure, beyond energy use alone. Choosing to decarbonize rendering is a meaningful step, but it must be integrated within a comprehensive strategy for responsible technology use across the entire production pipeline.

SHEET 5

Question the need to produce assets

Findings

Asset production, particularly in 3D workflows, is a major contributor to the digital carbon footprint in animation studios. Rendering assets in high definition requires significant computational power, energy, and equipment use. According to the International Sustainable Animation Coalition (ISAC), unnecessary asset production and excessive iterations can increase rendering-related emissions by up to 40 percent. While physically based rendering (PBR) and hyper-realistic visuals have become industry standards in some sectors, they are not always essential to storytelling or visual coherence. At Ulysses Filmproduktion in Germany, early-stage validation practices significantly reduce redundant asset creation. Their process involves validating films at the layout stage with broadcasters and incorporating feedback from school screenings of animatics.

Priority

Difficulty

Financial gain

Good to know

Reducing rendering iterations and asset overproduction not only cuts energy consumption but also saves time, improves project clarity, and reduces team stress. Studios that incorporate audience feedback earlier; such as through animatic screenings, report smoother validation and fewer last-minute revisions.

Levers

Implement strict validation processes

Structure the production pipeline to validate asset needs as early as possible. Avoid rendering assets without narrative or visual justification. Integrate progressive approval milestones with creative teams and clients to reduce revisions.

Avoid full-resolution rendering during early stages

A tiered rendering approach, such as that used by Supamonks (France), involves producing only three full-resolution frames per shot (start, middle, end) in the first round, then rendering the full sequence at lower resolution, and only rendering approved content in full resolution.

Challenge hyper-realistic rendering expectations

Reassess the need for ultra-detailed rendering styles such as PBR. Simpler or stylized visuals can reduce computational demands while maintaining artistic integrity.

SHEET 6

Versioning at the workspace level

Findings

3D animation projects generate large volumes of temporary and iterative data, particularly during asset creation, layout, and rendering stages. Without structured versioning, studios tend to accumulate redundant or unnecessary files across successive backup cycles, increasing storage demands and energy consumption. For example, a 2021 internal study by France's Cartouch'Verte network observed that a studio delivering a 3D series with a final asset volume of 15 TB ended up storing 107 TB due to a lack of data lifecycle management. Similarly, a report by Ubisoft's Technical Art Department found that structured versioning could reduce storage use by up to 65 percent over a project cycle.

Priority

Difficulty

Financial gain

Levers

Adopt version control systems adapted to audiovisual workflows

Generic systems like Git are poorly suited for large binary files commonly used in animation. Industry-specific tools include:

Helix Core by Perforce (United States), widely used in video game and animation studios, including Ubisoft, for managing high-volume collaborative asset production.

Unity Version Control (formerly Plastic SCM) by Unity Technologies (United States), which provides automated file tracking, branching, merging, and efficient binary storage.

Structure file lifecycle and storage policies

Introduce consistent naming conventions, track file versions across stages, and implement deletion or archiving rules aligned with project milestones. This helps avoid unnecessary data retention and optimizes storage infrastructure throughout production.

> **Good to know**
>
> Beyond environmental gains, efficient versioning improves team coordination and production reliability. The implementation of structured data management is especially beneficial in mid-sized and large studios with multiple concurrent pipelines.

FOOD AND CATERING

PART 4/6

Number of sheets : 8

SUMMARY SHEET

FOOD AND CATERING

Introduction

Food is both a major contributor to greenhouse gas (GHG) emissions and one of the sectors most directly affected by climate change. Globally, the food system, including agriculture, processing, packaging, transport and waste, accounts for approximately 25 percent of GHG emissions, according to the Intergovernmental Panel on Climate Change (IPCC). It is also highly vulnerable to climate disruptions such as droughts, floods, rising temperatures, and biodiversity loss.

In office-based industries like animation, food-related emissions are mostly indirect, but still significant. Staff meals, particularly when they rely on meat, imported goods or heavily processed food, can account for a considerable share of a studio's carbon footprint. On the other hand, improving food practices is one of the most tangible and achievable ways to reduce environmental impact in the workplace.

This section highlights four main levers for action:

1. Raising awareness about the environmental footprint of food, especially concerning animal products and processed meals
2. Promoting sustainable food choices, such as local, seasonal, organic and plant-based options
3. Leading by example during studio events, through sustainable catering and low-impact grocery purchases
4. Providing a well-equipped, functional kitchen space to support in-house meal preparation and reduce dependency on takeout

Sustainable food practices do not require drastic shifts. They rely on small, well-informed decisions that, over time, contribute to reducing emissions, strengthening ecological resilience, and fostering a more responsible studio culture.

SHEET 1

Raise awareness among employees about emissions related to their diet

Findings

Priority

Difficulty

Financial gain

Dietary choices have a major influence on individual carbon footprints. In most industrialized countries, food represents between 20 and 30 percent of individual greenhouse gas (GHG) emissions, with animal-based products, especially red meat, being the highest contributors. According to the European Environment Agency, dietary shifts could reduce food-related emissions by 30 to 70 percent depending on the country and the level of meat and dairy consumption.

In Ireland, the Environmental Protection Agency (EPA) reports that agriculture is the largest sectoral contributor to national emissions, driven by livestock. In Italy, a 2022 study by ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development) showed that reducing meat consumption could lower the average dietary footprint by 25 percent. In Greece, research from the Agricultural University of Athens highlights the potential of plant-based Mediterranean diets to cut food-related GHGs in half. In Sweden, the government promotes sustainable food choices through national dietary guidelines integrating environmental indicators. In Canada, the new Food Guide encourages less meat and more plant-based proteins, aligning health and climate goals.

→ see next page

Sheet 1. Raise awareness among employees about emissions related to their diet

Levers

Designate a sustainable food coordinator

Appoint a motivated team member to lead awareness and training activities. This person should receive support and training on sustainable food systems and internal communication.

Provide footprint calculation tools

Encourage employees to estimate their personal food-related emissions using national or international carbon footprint calculators (e.g. WWF UK's footprint tool or Canada's "Sustainable Diet" calculator). Such tools help visualize impacts and motivate change.

Facilitate educational workshops

Organize lunchtime sessions or team meetings on the link between food and climate, emphasizing practical tips, such as prioritizing seasonal produce, reducing red meat, or minimizing processed food.

Address co-benefits and local adaptation

Highlight the link between food choices, personal health, and planetary health. Discuss climate risks to local agriculture, as done in regional resilience assessments in Italy or the Food Climate Research Network's country-specific reviews.

> **Good to know:**
>
> The World Health Organization recommends limiting red and processed meat. Shifting toward plant-rich diets can also mitigate supply-chain vulnerabilities and improve nutritional quality. Tools like EcoScore or Open Food Facts (available in multiple countries) help compare the environmental and health profiles of food products.

SHEET 2

Promote seasonal, local,organic and vegetarian meals

Findings

Priority

Difficulty

Financial gain

Encouraging sustainable food practices within the workplace can reduce the environmental footprint of daily meals while improving health outcomes. Practices such as choosing seasonal produce, reducing meat consumption, buying organic and local, minimizing packaging, and avoiding food waste are increasingly promoted across the animation industry in several countries. While food is often a personal matter, collective practices and workplace support can foster long-term change.

In Italy, the animation company Studio Bozzetto collaborates with local cooperatives to provide seasonal and organic produce for staff events. In Ireland, Cartoon Saloon facilitates bulk deliveries of regional products and supports staff with educational resources on low-impact meals. In Greece, creative collectives in Thessaloniki have introduced “shared baskets” of local produce to support nearby farms and reduce packaging. In Belgium, the non-profit Animation Guild Flanders hosts workshops with local chefs on plant-based meals for audiovisual professionals. In Germany, Studio Soi offers a regular “vegetarian Friday” supported by regional suppliers and team involvement.

Sheet 2. Promote seasonal, local,organic and vegetarian meals

Levers

Lead by example at team events

Select catering services and grocery shopping that prioritize sustainable criteria: seasonal, vegetarian, organic, local, and low-packaging options. These choices reflect the company's values and raise awareness.

Encourage sustainable snacking and fridge stocking

Replace vending machines with fresh fruit, nuts, and other low-impact snacks. Stock shared fridges with environmentally friendly condiments, drinks, and leftovers in reusable containers.

Promote vegetarian meal habits

Introduce recurring vegetarian days or collaborative cooking sessions. Support initiatives such as 'Meat-Free Mondays' or provide incentives for low-impact meals.

Share information on nearby food options

Compile and share a list of nearby restaurants and take-out options that offer plant-based or low-impact meals. Include indications on seasonality, packaging, or origin.

Support local and organic deliveries

Facilitate regular delivery of organic produce baskets to the office. Group ordering lowers transport emissions and builds community around sustainable habits.

Raise awareness on the footprint of common products

Display visuals near coffee areas or in lunchrooms to highlight the impact of everyday food items and suggest low-carbon alternatives such as whole beans or bulk products with ethical labels.

SHEET 3

Encourage reducing takeout meal packaging

Findings

Takeout meals often generate a large amount of single-use packaging waste, especially in countries where reusable systems are not yet widely adopted. While some studios have reported that takeout packaging represents the majority of their waste, solutions depend heavily on local infrastructure, cultural habits, and hygiene regulations. In countries like Germany or the Netherlands, reusable container systems are increasingly supported by local businesses and municipalities. In contrast, in parts of Eastern Europe or North America, the predominance of single-use packaging remains a challenge due to convenience, cost, or lack of standardized return systems.

Priority

Difficulty

Financial gain

Levers

Set an example during studio events

Use reusable dishes and containers for catering and encourage employees to do the same.

Support reusable containers for daily meals

Provide employees with reusable lunch boxes and bags, and promote their use at local takeout spots. Some studios have arranged collection and return systems with nearby restaurants.

Collaborate with food providers

Discuss packaging reduction options with delivery partners. Where feasible, suggest returning clean containers or allowing employees to bring their own.

Good to know

The success of reuse systems often relies on strong local logistics and trust in hygiene practices. Raising awareness among staff and suppliers, and working within the local context, is key to implementing effective low-waste habits.

SHEET 4

Prefer tap water and organic, local drinks

Findings

According to the French Agency for Ecological Transition (ADEME), the carbon footprint of bottled water can be up to 1,000 times greater than that of tap water. This is due to the production of plastic bottles, estimated at 175,000 tons per year in France, plus the impact of packaging, bottling, and transportation. On average, bottled water travels 300 km before reaching consumers. In some countries, like Slovakia, the Czech Republic, and Romania, deposit return systems have been implemented to improve the collection and recycling of plastic bottles and cans. These measures highlight growing awareness of the environmental cost of beverages and the importance of local solutions.

Priority

Difficulty

Financial gain

Levers

Make tap water the default choice in the studio

Use glass jugs or refillable bottles instead of plastic bottles or large water jugs. If tap water quality is an issue, provide filtration systems. Local water quality data is usually available from public health authorities or environmental agencies.

Offer local and organic drinks at events

For studio events, choose beverages from nearby producers and avoid single-use packaging. Prioritize drinks available in bulk or glass containers when possible.

Good to know

Several European countries promote public tap water consumption through citywide initiatives, such as free public fountains, refill stations, or apps to locate tap water points. Taking advantage of such infrastructure can help reduce emissions and waste while encouraging healthier, more sustainable habits.

SHEET 5

Promote collective meals

Findings

In animation studios, meals can sometimes be delivered rather than prepared on-site, which generates transport and packaging emissions. Delivered meals also provide limited control over nutritional quality and GHG emissions, compared to meals cooked collectively or brought from home.

Priority

Difficulty

Financial gain

Levers

Encourage shared low-impact meals

Group ordering from sustainable caterers or grocery delivery platforms can reduce packaging waste and transportation emissions.

Equip a shared kitchen space

Providing a comfortable kitchen with basic equipment can encourage employees to cook simple meals on-site. This enhances both sustainability and team cohesion.

Good to know

Some studios or media companies implement on-site canteens with strong sustainability criteria, such as prioritizing local organic ingredients and reducing waste through reusable containers. While not feasible everywhere, such models offer useful inspiration.

SHEET 6

Value bio-waste

Findings

Organic waste, when not separated, is usually incinerated or landfilled, contributing unnecessarily to GHG emissions. Separate collection or composting turns bio-waste into a valuable resource. In countries like Slovakia and Austria, separate collection of organic waste is mandatory and well-organized.

Priority

Difficulty

Financial gain

Levers

Sort and recover organic waste

If your local system allows, ensure that organic bins are available and clearly labeled.

Where municipal collection is unavailable, consider small-scale composting (worm bins) or engaging nearby community composting programs.

Good to know

Proper composting helps enrich soils and can generate biogas via methanization. Even small studios can take part, provided minimal organization and space are allocated.

SHEET 7

Use reusable dishware

Findings

Disposable foodware, even when labeled recyclable or compostable, often ends up in landfills due to coatings and contamination. Durable dishware offers a more effective and sustainable solution.

Priority

Difficulty

Financial gain

Levers

Provide reusable items

Equip all employees with mugs and dishware. Use durable items even during special events and provide dishwashing facilities.

Use energy-efficient dishwashers

When used correctly, only when full, in eco-mode, and during off-peak hours, dishwashers consume less water and energy than handwashing.

Good to know

Cardboard cups often contain plastic linings that make them unrecyclable. Choosing durable materials or properly vetted alternatives helps studios avoid misleading eco-claims and reduce actual waste.

SHEET 8

Ensure the proper functioning of kitchen equipment

Findings

Kitchen appliances in break rooms are often overlooked, yet inefficient or poorly maintained fridges and freezers can significantly increase electricity use. A 1 cm layer of frost in a freezer can raise energy consumption by up to 30 percent. Ensuring optimal performance helps reduce emissions linked to electricity consumption in shared office spaces.

Priority

Difficulty

Financial gain

Levers

Choose energy-efficient appliances

When purchasing or replacing equipment, select refrigerators, dishwashers, or microwaves with high energy ratings (A or B, where applicable), and models that use less water and electricity.

Maintain equipment regularly

Set the refrigerator to a maximum of 8°C and the freezer between -18°C and -24°C. Check door seals using the paper test: if a sheet of paper slides out easily when closed in the door, the seal may be worn and should be replaced. Defrost regularly to avoid ice buildup.

Good to know

In shared kitchen spaces, low-efficiency or poorly maintained appliances may run continuously or overwork to compensate for poor insulation. Simple habits and routine checks can lead to substantial savings in energy use and emissions over time.

TRANSPORTATION

PART 5/6

Number of sheets : 6

SUMMARY SHEET

TRANSPORTATION

Introduction

Transport is one of the largest contributors to greenhouse gas (GHG) emissions worldwide. According to the International Energy Agency (IEA), the transport sector is responsible for nearly 25% of global energy-related CO_2 emissions, with passenger transport accounting for more than half of that total. These emissions come not only from long-distance travel, but also from daily commuting and short trips that are often underestimated in climate strategies.

In the animation sector, mobility is rarely considered a central environmental challenge. Yet, when studios are located outside dense urban centers, transportation can become one of the largest sources of emissions, especially when commuting is done individually by car. For instance, a 2023 study from the European Environment Agency notes that more than 70% of daily commuting in Europe is done by private car, often with low occupancy rates. In the United States, the U.S. Census Bureau reports that over 75% of workers drive alone to work.

In real-world studio settings, mobility-related emissions can represent 20 to 40% of a company's carbon footprint, depending on location, infrastructure, and travel policies. Despite the rise of remote work, business travel to international events, festivals, or coordination meetings with partners remains common, and often conducted by plane or car.

Reducing these emissions involves five complementary strategies widely recommended by international frameworks such as the IEA's Net Zero by 2050 roadmap and the IPCC's climate mitigation guidelines:

- Reducing travel demand, through remote work and office localization.
- Shifting to lower-carbon transport modes, such as public transit, walking, or cycling.
- Increasing vehicle occupancy, for example through carpooling or shared shuttles.
- Improving vehicle energy efficiency, via eco-driving and right-sizing of company vehicles.
- Switching to low-emission energy sources, including electric, hybrid, or hydrogen mobility.

Each of these actions must be adapted to local contexts. Urban areas may offer strong public transport options, while rural or mountainous regions may require different approaches. What matters is not applying a single model, but recognizing that mobility is a powerful lever for climate action, when it is measured, understood, and integrated into everyday decisions.

SHEET 1

Understand and measure mobility and transport

Findings

Mobility is a major source of emissions for animation studios, particularly when daily commuting or travel for production activities is involved. Yet few studios have a clear understanding of how their teams move. Without this knowledge, it is difficult to take effective action or secure employee engagement.

In some countries, regulations encourage companies to implement sustainable mobility plans. For example, in Belgium, large employers are required to report employee commute data, while in Germany, mobility management initiatives are promoted through regional support schemes. In countries with fewer public transport options or colder climates, different strategies may be necessary, but understanding current mobility patterns remains essential.

Priority

Difficulty

Financial gain

Good to know

Being responsible with mobility does not mean applying the same solution everywhere. A studio in rural Romania may not have the same options as one in Amsterdam. The key is to make informed, realistic decisions that reflect local infrastructure, climate, and daily constraints. The goal is not perfection, but progress.

Levers

Appoint a sustainable mobility coordinator

Designate someone to assess commuting and business travel needs and explore low-carbon alternatives. This role can be full-time, part-time, or voluntary depending on your studio's size and context. The coordinator may also support onboarding processes by helping new employees identify low-emission travel options.

Develop a mobility plan

If your studio employs over 100 people or is located in an area with relevant regulations, consider creating a company mobility plan. This plan should evaluate commuting modes, identify emission hotspots, and propose concrete alternatives such as carpooling, subsidized public transport, or telecommuting policies.

Raise awareness through training

Organize workshops or invite external experts to help teams understand the environmental impacts of different transportation choices. In Italy, for example, some animation companies collaborate with mobility NGOs to deliver awareness campaigns. In Ireland, the Sustainable Energy Authority offers resources that can be adapted to the creative sector.

SHEET 2

Moderate the demand for transport

Findings

In most countries, people spend a consistent amount of time traveling daily, about one hour, typically over three to four trips. While transport technology has improved, increasing average travel speeds by up to a factor of ten, this has encouraged people to live farther from work and increase their reliance on cars.

This is especially problematic in less urbanized or structurally car-dependent regions such as the Western Balkans (Bosnia and Herzegovina, North Macedonia, Albania), rural Poland, or some areas of Greece and Slovakia. In these contexts, sustainable mobility options like rail or public transport may be scarce, unreliable, or underfunded.

A study from the European Environment Agency notes that short car trips (under 3 km) are particularly harmful due to cold engine starts and should be a priority target for emission reduction. Yet, in countries with fragmented transit systems or challenging topography, alternatives are not always practical, and solutions must be adapted to local realities.

Priority

Difficulty

Financial gain

→ see next page

Sheet 2. Moderate the demand for transport

Levers

Encourage teleworking when appropriate

Remote work can drastically reduce commuting needs. In Bulgaria and Hungary, several IT and design companies have adopted hybrid models that combine studio presence and remote flexibility, reducing employee reliance on cars in urban fringes.

A report by the OECD in 2022 noted that teleworking was particularly effective in limiting emissions in medium-sized cities with weak transit networks. Studios should support teleworking where technically possible and socially acceptable, using solutions like secure remote desktop protocols and cloud-based workflows.

Provide on-site dining spaces

In countries where employees traditionally return home for lunch, providing a shared kitchen or dining space at the studio can prevent unnecessary midday trips. This also fosters team cohesion.

Hire locally and support short-distance commuting

Studios can prioritize hiring people who live close to the workplace or have access to soft mobility (walking, biking, public transport). Some small studios in Croatia and Slovenia have started coordinating with local housing offices to help new recruits find nearby accommodation.

Consider accessibility when choosing studio location

If relocating or expanding, choose areas with existing low-carbon mobility infrastructure. In Vilnius (Lithuania), several creative companies have moved into redeveloped industrial zones connected to public transit and bike paths. Tools like the European Urban Mobility Observatory can help assess location suitability.

Set up satellite offices when relevant

In Romania and Northern Greece, where long commutes from surrounding villages are common, animation companies have opened small satellite spaces or allowed coworking in shared creative hubs. This approach minimizes daily travel distances and helps retain local talent.

> **Good to know**
>
> Sustainable mobility is not about perfection, but progress. Studios in less connected regions should focus on what's feasible: reduce avoidable trips, support soft modes when possible, and raise awareness of transport impacts. Responsible travel is a mindset, not a rigid model.

SHEET 3

Encourage modal transport shift

Findings

A modal shift means reducing reliance on private cars by promoting alternatives such as walking, cycling, public transport, or multimodal combinations. According to the European Environment Agency and the International Transport Forum, road traffic remains the primary mode of transport in many countries and is a major source of greenhouse gas emissions.

Short-distance travel is particularly relevant. Worldwide, 50 percent of urban trips are under 3 kilometers. In well-equipped cities like Amsterdam, Ljubljana, or Copenhagen, cycling is often faster than driving during peak hours. On average, cyclists travel at 15 km/h in cities, while cars average 14 km/h.

However, the reality varies greatly within each country. While urban centers often have better infrastructure, rural or suburban areas may lack frequent public transport or safe cycling paths. In hot climates, cold regions, or mountainous terrain, active travel may be less practical. Promoting modal shift must therefore be adapted to local conditions, encouraging realistic and inclusive solutions.

Priority

Difficulty

Financial gain

→ see next page

Sheet 3. Encourage modal transport shift

Levers

Leverage sustainable commuting incentives

Many countries offer schemes to support low-carbon commuting. For example, Germany has the Jobticket for public transport, the UK offers the Cycle to Work Scheme, and Belgium provides a cycling kilometer reimbursement. Studios can make use of national frameworks or create their own incentive programs to support employees' efforts.

Install secure cycling infrastructure

Secure bicycle parking and facilities like lockers and showers reduce barriers to daily cycling. In Ireland, the National Transport Authority funds employer-led cycling facilities. Studios across Europe, from Portugal to Poland, have improved cycling adoption by offering basic infrastructure and supporting employee initiatives.

Support conditions for daily use

Providing practical support, such as bike maintenance kits, drying areas, and safe storage, can help overcome common challenges like weather or mechanical issues. These adjustments make commuting more feasible and inclusive, especially in regions with variable climates or longer distances.

Coordinate with local authorities

Studios can engage with municipalities to request better public transport options or safer active travel routes. Local authorities are often receptive to initiatives that improve mobility in business areas. Whether in Spain, Slovakia, or Greece, partnerships between studios and transport agencies have helped improve access for employees.

> ### Good to know
>
> Every country faces regional disparities. A studio located in a major city may have extensive public transport and cycling infrastructure, while one in a rural or industrial area may not. Responsible transport strategies should be grounded in the local context. It is not about ideal solutions, but about encouraging low-carbon options whenever possible, adapting to constraints, and engaging teams in the process.

SHEET 4

Improve vehicle occupancy

Findings

Motor vehicles used for commuting typically carry only one person, with an average occupancy rate of 1.1. Even across all trip types, the rate only rises to 1.6. These figures reflect a major inefficiency in daily travel. Maximizing vehicle occupancy is a simple and effective way to reduce emissions when other transport options are limited.

Priority

Difficulty

Financial gain

Levers

Promote carpooling

Carpooling is especially valuable for employees who live far from public transport or in areas with limited mobility options. Studios can encourage it by facilitating employee matching through surveys or mobility audits. International platforms like BlaBlaCar Daily (France), Waze Carpool (USA), or Liftshare (UK) offer user-friendly solutions. Local providers may also exist depending on the country.

Raise awareness

Organize practical sessions or app demonstrations to motivate employees to try carpooling. Making it easy and visible helps normalize shared transport, especially when integrated into workplace culture.

Good to know

Carpooling not only reduces emissions but also cuts commuting costs, fosters social interaction, and may improve punctuality and reliability when well coordinated.

SHEET 5

Reduce vehicle energy consumption

Findings

Vehicle energy consumption depends largely on two factors: weight and speed. Physics tells us that the energy needed to accelerate increases with mass and rises exponentially with speed. For example, reaching 100 km/h requires four times more energy than reaching 50 km/h.

This has a direct impact on fuel or electricity use in company vehicles, whether they are owned by the studio or used by employees for commuting or business travel. In countries with limited alternatives to car travel, such as rural areas in Hungary, Portugal or parts of the Balkans, reducing energy consumption without reducing mobility becomes particularly important.

Green driving, also known as eco-driving, is one of the most accessible and impactful strategies to address this issue. It can reduce fuel use by 10 to 20 percent, lower emissions, and improve safety, with no added investment in infrastructure or vehicle technology.

Priority

Difficulty

Financial gain

Good to know

Green driving also reduces stress and fatigue for drivers, lowers the risk of accidents, and extends vehicle lifespan. In countries where public transport is not always a viable option, this approach can make a significant difference with minimal effort.

Levers

Train employees in green driving techniques

Green driving consists of simple practices: maintaining moderate speeds, avoiding sudden acceleration or braking, anticipating stops, and using engine braking. Several training organizations worldwide offer in-person or digital modules. In France, Centaure offers on-track eco-driving sessions; in the UK, Energy Saving Trust provides workplace driver training; and in Italy, the Safe Drive Academy offers certified eco-driving programs.

Raise awareness with internal campaigns

Studios can promote green driving through short workshops, posters in company vehicles, or online learning platforms. Small reminders, such as checking tire pressure or lightening the load, can help maintain good habits.

Encourage efficient travel planning

For production-related trips, optimize routes to avoid unnecessary mileage. Encourage car sharing when possible, and consider remote meetings to reduce non-essential travel.

SHEET 6

Prefer trains over planes or individual cars

Findings

In the animation industry, long-distance travel is often required to attend festivals, meet partners, or coordinate with international teams. These trips, while sometimes necessary, can carry a significant environmental cost. For equivalent distances, a plane seat and a single-occupant car produce comparable levels of emissions. In contrast, train travel can generate nearly 100 times fewer emissions, especially when powered by low-carbon electricity sources.

Trains also offer comfort, working time, and station-to-city-center convenience. However, not all countries or regions have access to reliable rail networks. In parts of Southeast Europe, the Baltics, or rural Spain and Italy, train options may be limited or significantly slower than air travel. In such cases, studios must balance ambition with realism and aim for the most sustainable alternative available.

Priority

Difficulty

Financial gain

Good to know

In countries without high-speed rail, night trains or regional rail options are being reintroduced in several parts of Europe, including Austria, Slovakia, and Croatia. These developments, combined with improved booking platforms and international rail passes, are making long-distance train travel more practical. Studios can also help normalize train use by sharing itineraries, tips, or even group booking support internally.

Levers

Review long-distance travel practices

Encourage train travel for inter-city and international trips when feasible. Producers, project managers, and studio leaders who frequently travel to major cities can often replace flights with train journeys. In regions with limited rail options, prioritize efficient carpooling or use hybrid mobility plans. When train routes are long, consider offering compensatory time or flexible schedules to make low-carbon travel more manageable.

Adopt video conferencing as the default

For many internal and external meetings, video calls can replace physical travel. This requires a good internet connection, quality audio and video equipment, and training on remote collaboration tools. Studios can designate quiet rooms or shared virtual meeting spaces to ensure smooth and professional calls.

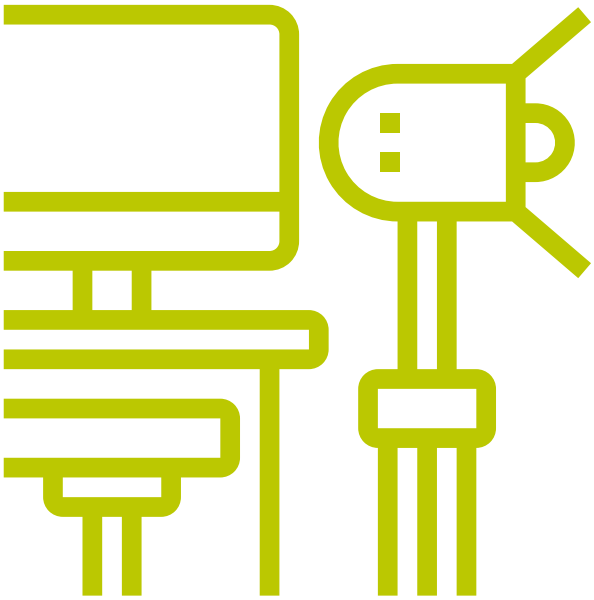
Switch to electric vehicles when car travel is necessary

When train travel is not viable and car use is required, opt for small electric vehicles or shared electric fleets. In countries like Slovenia or Portugal, government incentives for EV leasing make this increasingly accessible. Partnering with nearby studios or suppliers to share low-emission vehicles is another option.

CONTENT AND MERCHANDISING

PART 6/6

Number of sheets : 6



SUMMARY SHEET

CONTENT AND MERCHANDISING

Introduction

Stories have always shaped how societies imagine their futures. Today, faced with the urgent ecological challenges of our time, the animation industry has a unique responsibility, and opportunity, to inspire new ways of living, thinking, and dreaming. Animation, by its very nature, offers the freedom to create worlds from scratch. It can help audiences, particularly young ones, envision resilient, sustainable futures and foster deeper connections with the living world.

This section offers tools for creators who wish to reflect the realities of the ecological transition in their work. It is not about restricting creativity, but about expanding it: questioning inherited narratives, exploring new representations, and embedding sustainability in subtle and powerful ways. Through training, reflection, and conscious storytelling choices, animation can become a key player in reimagining a desirable, inclusive, and sustainable world.

SHEET 1

Train artists and producers

Findings

Priority

Difficulty

Financial gain

The animation industry, more than many others, speaks directly to younger generations, who will live with the consequences of today's environmental choices. As highlighted by Myriam Hammad from France Télévisions' Medialab, quoting Ursula von der Leyen, President of the European Commission: «Films can truly pull at your heartstrings. They can make you laugh and cry. They can spotlight an important issue. They can lead people to embrace a cause. And that's exactly what our planet needs right now.»

Today, creative industries are increasingly encouraged by European and international institutions to integrate climate and environmental concerns into their production strategies. While support for storytelling remains limited, several audiences show growing interest in stories that reflect these issues. International initiatives such as Climate Story Labs (United States, UK, Global South), the Good Energy Project (USA), or Albert (UK), which offers a «Subtitles to Save the World» guide and editorial tools, provide valuable resources and training for writers and producers on how to embed climate themes in all genres, from fiction to factual content. Yet without proper training, many professionals may still feel unequipped to take on these complex topics.

→ see next page

Sheet 1. Train artists and producers

Levers

Raise awareness among artists and producers

As with all teams, raising awareness among creative talents is critical. Artists and producers should be included in general workshops on climate, energy, biodiversity, and resource scarcity. Such sessions help them move beyond misinformation or fear of «preachy» storytelling and embrace more nuanced approaches.

Offer targeted sustainability training for creatives

Studios, broadcasters, or production companies can organize dedicated workshops aimed at writers, directors, and producers to strengthen their capacity to integrate sustainability into their creative processes. These workshops should explore how environmental issues can be naturally incorporated into different genres, from comedy to drama and children's animation, without compromising the artistic integrity of the stories. They can also provide techniques for creating characters and plots that reflect ecological realities in a subtle and compelling way, avoiding moralizing approaches that risk disengaging audiences. In addition, participants should be encouraged to understand the deep interconnections between environmental sustainability, social justice, and biodiversity, and to consider how these dimensions can enrich narratives and offer new creative perspectives.

Sustainability-focused organizations, freelance specialists, and new platforms (e.g., Climate Story Unit by Exposure Labs, Imagine 2050 in France) provide training programs and toolkits adapted to creative professions.

> **Good to know**
>
> Training on sustainability is no longer optional. In France, since 2022, sustainability education has been mandatory for all film and animation students (Action! Plan by CNC). In the UK, BAFTA's initiatives through its green creative content program are encouraging the integration of climate awareness at every stage of content development.
>
> More broadly, the global movement for «climate storytelling» is growing fast, supported by networks of filmmakers, writers, and producers committed to transforming cultural narratives.

SHEET 2

Tell new stories

Findings

Priority

Difficulty

Financial gain

The stories we tell shape how societies imagine their future, and whether or not they can envision a sustainable world. Yet environmental narratives remain almost invisible in global media. A 2022 study from the University of Southern California Annenberg School found that only 0.6 percent of over 37,000 scripts analyzed mentioned climate change. This gap underscores a crucial opportunity for animation creators: to imagine futures where ecological balance, resilience, and solidarity are not exceptions but norms.

Levers

Question foundational assumptions

Tools like the French collective L'Écran d'après or the Climate Lens developed by Good Energy Stories (United States) encourage writers to critically examine the basic premises of their stories:

- What kind of world is depicted : one of endless consumption, or one of balance and community?
- What motivates the characters : individual ambition, material accumulation, or collective well-being?
- How is nature represented : as a backdrop, a resource to exploit, or a living system to respect?

Rethinking these foundations is not about producing didactic works, but about expanding the emotional, symbolic, and cultural palette available to creators.

Propose alternative futures

Inspirations can be found in the Solarpunk movement, which envisions optimistic futures based on sustainability, low-tech solutions, and cooperative communities. Similarly, initiatives like Imagine 2050 or the Reality Reimagined report by RARE provide narrative frameworks to imagine life within planetary boundaries without resorting to dystopian fatalism.

→ see next page

Sheet 2. Tell new stories

Good to know

Practical tools such as the Planet Test developed by Futerra offer writers simple criteria to check whether their stories integrate ecological realities:

1. Does the story acknowledge nature's existence and importance?
2. Are harmful behaviors to the environment questioned?
3. Is at least one positive environmental action shown?

By embracing these approaches, animation studios and creators can offer powerful new imaginaries that resonate deeply with today's audiences, and contribute to building cultural foundations for a sustainable future.

SHEET 3

Influence representations

Findings

Film productions, consciously or not, help establish cultural norms. They set benchmarks for what is considered "normal," "desirable," or "successful." Every detail, from a character's mode of transport to the background landscapes, transmits messages and shapes audiences' perceptions.

If we systematically show lives centered around car dependency, overconsumption, and material accumulation, we reinforce models that are incompatible with a sustainable world. Conversely, adjusting representations can subtly but powerfully influence imaginations toward more sustainable lifestyles.

International initiatives such as Planet Placement (UK), led by the British organization Albert, and Good Energy (USA) advocate for embedding positive ecological models into everyday storytelling without altering the fundamental narratives.

Priority

Difficulty

Financial gain

→ see next page

Sheet 3. Influence representations

Levers

Adjust lifestyle and environmental representations

Without changing the plot, studios can modify background elements and character choices to align with low-carbon, sustainable behaviors. For example:

- Represent low-emission mobility as standard by showing characters walking, cycling, or using public transport as part of daily routines.
- Normalize sustainable food choices by depicting local, seasonal meals and plant-based diets in everyday scenes.
- Integrate visible energy efficiency by including solar panels, smart thermostats, or passive cooling systems in homes or buildings.
- Depict circular economy habits such as reusing, repairing, or repurposing objects rather than replacing them.
- Highlight community-based living environments, with shared spaces, urban greenery, or local resource exchange, instead of isolated, consumption-driven settings.

Such representations normalize sustainable behaviors without making them the story's focus or becoming didactic.

Promote diversity and resilience

Environmental storytelling is inseparable from social inclusion. Representing diverse communities actively participating in the ecological transition strengthens both realism and identification.

Efforts can be inspired by projects like Green Storytelling Guidelines (European Broadcasting Union) or Storyfutures (UK), which emphasize inclusivity and environmental responsibility.

SHEET 4

Include the living world in storytelling

Findings

In many stories, nature is treated as a passive backdrop rather than an active participant. Forests, oceans, animals, and ecosystems often serve merely as scenery or symbolic devices, disconnected from the narrative's main dynamics.

Yet the living world, plants, animals, landscapes, is not inert. It is active, interconnected, and profoundly affected by human actions. Strengthening the presence of biodiversity in narratives is an opportunity to rebuild emotional connections between audiences and the environment.

Recent environmental communication research, such as the work of the International Environmental Communication Association (IECA), emphasizes that representing the complexity and vitality of ecosystems in storytelling can foster deeper ecological awareness and empathy.

Priority

Difficulty

Financial gain

Good to know

Care must be taken to avoid overexposing or romanticizing specific locations. Media-induced over-tourism has harmed many fragile ecosystems. For example, the surge in visitors to Iceland following its depiction in films and series led to significant environmental degradation. Producers can work with environmental consultants to balance storytelling goals with ecological responsibility when using real-world locations.

Levers

Portray biodiversity as a dynamic force

Instead of treating nature as a neutral backdrop, integrate living beings, animals, plants, ecosystems, as full narrative elements.

For instance:

- A tree that ages alongside the protagonist, reflecting changes in the environment.
- Wildlife behavior that signals shifts in an ecosystem's health or balance.
- A cityscape where green spaces are living characters interacting with humans.

Japanese animator Hayao Miyazaki has long modeled this approach, with films like Princess Mononoke or My Neighbor Totoro depicting humans as part of interconnected natural systems.

Highlight the complexity of natural systems

Avoid idealizing nature as a «pure» or «untouched» paradise. Represent the real dynamics: symbiosis, predation, resilience, and regeneration. These depictions invite audiences to view the environment as an intricate, living system rather than a static or fragile object.

SHEET 5

Subtle planet placement in content

Findings

In film production, the concept of «planet placement» refers to the deliberate but non-intrusive inclusion of sustainable behaviors and practices into scenes, characters' habits, and background environments. It is inspired by the logic of product placement but applied to ecological values rather than commercial brands.

Planet placement allows works to normalize sustainable lifestyles without making them the central narrative focus. This technique has been increasingly encouraged internationally, notably by campaigns such as the Creative Climate Disclosure movement in the UK, and initiatives like Good Energy Stories that advocate for embedding climate-positive elements naturally into mainstream storytelling.

Priority

Difficulty

Financial gain

Levers

Incorporate sustainable gestures into everyday scenes

These elements rely on visual storytelling rather than dialogue. For example:

- Reusable water bottles or thermoses
- Public transport, bicycles, or walking
- Repairable and second-hand objects
- Energy-saving practices visible on screens, appliances, or lighting

These insertions can happen without any dialogue, moralizing, or plot explanation, allowing ecological habits to appear as ordinary, appealing, and aspirational.

Coordinate planet placement across departments

Sustainable representation does not only concern writers: it must involve art direction, costume design, set design, and props. Collaborative discussions at early production stages can ensure that eco-responsible choices are integrated coherently and creatively across the project.

Good to know

Planet placement must be consistent with the story world. For example, a fantasy epic set in a medieval world where everyone uses bamboo toothbrushes would of course break immersion. On the other hand, a near-future urban series showing solar panels, urban farms, or shared mobility systems naturally enriches the world-building while reinforcing desirable futures.

When done thoughtfully, planet placement enhances realism and strengthens emotional resonance without feeling forced.

SHEET 6

Reduce the impact of merchandise

Findings

Indicators and findings

Priority

Difficulty

Financial gain

In the animation industry, merchandise plays a complex role, both as a strategic financial asset and a significant environmental challenge. While it may not generate the same level of direct emissions as energy-intensive activities like digital infrastructure or travel, its global production and distribution chains carry a heavy carbon cost that is often overlooked.

Although comprehensive sector-wide data is lacking, the available studies suggest merchandise emissions are far from negligible. A 2018 analysis by CITEPA (France's Centre for Technical Studies on Air Pollution) compared emissions intensity by country, revealing wide disparities in the carbon footprint of economic activity. Producing €1 million in added value emits:

- 155 tonnes of CO_2e in France,
- 272 tCO_2e in the United States,
- and up to 1,023 tCO_2e in China.

Given that the vast majority of licensed merchandise, particularly toys, apparel, and accessories, is manufactured in countries with high-emission energy grids, low labor costs, and weaker environmental and social regulations, the actual footprint of physical branded goods is likely considerable.

For example, in 2018, Disney generated approximately $5 billion from merchandise (8% of its total revenue), while its theme parks contributed $20 billion (34%). These numbers underscore the economic stakes at play. Though Disney is an outlier, smaller studios, especially those with successful international series, also see merchandise as a way to fund new content or extend brand reach.

However, with growing scrutiny on production ethics, waste, and environmental degradation, merchandise is now a reputational issue. Items often end up as short-lived products with significant embedded emissions, contributing to landfill overflow or even being exported as waste to countries lacking proper disposal infrastructure.

A studio in Canada has begun addressing these concerns contractually. Their legal and licensing teams are attempting to introduce sustainability clauses into agreements with manufacturers, requiring reporting on toxic chemicals and environmental practices. But the feedback is clear: toy manufacturers and other producers currently hold the upper hand in negotiations. Without coordinated, industry-wide pressure, isolated sustainability demands are rarely enforced.

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Sheet 6. Reduce the impact of merchandise

Levers

Rethink the necessity of merchandise

For productions carrying an ecological message, or those where merchandise is unlikely to bring substantial revenue, it may be appropriate to forego merchandise altogether. This decision, while bold, ensures alignment between content and commercial practices.

Producer Delphine Maur, for instance, explicitly rejected merchandise for an environmentally themed series: "We do not want these items to contribute to ocean pollution or become waste exported to developing countries." However, many studios rely on consumer products as part of their financial model. Refusing merchandise is a legitimate path, but not one all companies can afford to take.

Reduce environmental impacts throughout the value chain

Studios that choose to engage in merchandise can adopt a mitigation approach by working on three key fronts:

Materials and processes: Choose certified sustainable materials (e.g., GOTS for textiles, FSC for paper products), avoid PVC and other harmful plastics, and opt for factories with low-carbon energy sources.

Packaging: Reduce volume and weight, eliminate plastic where possible, use recyclable or compostable materials, and design reusable or dual-use packaging (e.g., boxes that turn into playsets).

Logistics: Localize production when feasible, or at least consolidate shipping to reduce emissions. Air freight, often used for urgent product launches, should be avoided in favor of rail or maritime transport.

Engage collectively for systemic change

Studios can amplify their influence by joining initiatives like Products of Change, a UK-based international network aiming to green the consumer products industry. The platform gathers IP owners, retailers, manufacturers, and consultants to co-develop sustainable practices. Membership provides access to environmental data, supplier toolkits, educational webinars, and working groups on sustainable design, reporting, and licensing.

The collective philosophy is simple: if studios align their expectations, suppliers will be more likely to comply. Studios of all sizes can participate, reinforcing one another's efforts to set new baselines across the industry.

Good to know

Sustainability is no longer a niche concern. Audiences, especially younger generations, expect brands to act responsibly, and consumer goods are a visible marker of a studio's values. Whether through refusing merchandise, reducing its impact, or collaborating with others to shift industry norms, each studio can take meaningful steps. Transparency, consistency, and progress matter more than perfection.

Merchandise is not inherently incompatible with environmental goals, but it must evolve. It is up to content creators and rights holders to make this evolution happen, and to ensure that the stories they tell are not undermined by the products they sell.

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