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RETHINKING THE  
VALUE CHAIN

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Accounting for natural  
capital in the value chain

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# INTRODUCTION

The one element on which the entire value chain depends and impacts is natural capital. Natural capital – forests, rivers, minerals, oceans, air, land – provides essential services to business, economies and society. Natural capital underpins all other forms of capital, including financial. Despite this, natural resources are being depleted at an alarming rate, presenting new risks such as price volatility, as well as potential commercial opportunities.

The success of many businesses will increasingly depend on how well they understand, and manage, their natural capital dependencies and impacts. This understanding must extend well beyond their own operations to their entire value chain – from suppliers to consumer use. For some organisations their direct operations account for a relatively low percentage of their environmental impact. Their biggest impacts are caused by consumers using their goods and services, or by their suppliers (for example raw materials producers and processors). As the scarcity and volatility continue to increase prices of natural resources, organisations will see a decline in profit margins, reduced growth and reputational issues.

With growing attention from both governments and non-governmental organisations in the preservation and valuation of nature, it may not be long before companies are forced to pay for their environmental impacts. Investors too are becoming concerned about how corporations manage nature. 34% of organisations surveyed by EY in 2013 had been asked by investors and shareholders about their sustainable sourcing of raw materials.

In response to these mounting pressures, forward-thinking organisations have begun to look at their relationship with nature – both dependencies and impacts. They are starting to account for nature in corporate decisions and link natural capital management to commercial success. Puma, for example, is working closely with its supply chain to reduce environmental impacts, and Unilever and Levi Strauss are focusing on consumer-use impacts.

This report explores the risks and opportunities from natural capital depletion and how businesses are accounting for nature to improve decisions in their value chain. It also explores the role of accountants in supporting the adoption of natural capital accounting, and provides five practical recommendations for CGMAs.

CGMAs have an important role in navigating their organisations through the challenges of natural capital depletion. They have the skills and oversight to make the connections between natural capital, commercial opportunity and risk, and ultimately commercial performance.

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# THE STATE OF NATURE

Despite the importance of natural capital to business, economies and society, it is being eroded at an alarming rate.

Natural Capital provides business and society with a range of critical services including:

- **provisioning services**, such as air, fresh water, agricultural production, timber, fish stocks and medicine
- **regulating services**, such as carbon storage, climate regulation, waste treatment and pollination
- **cultural services**, such as recreation and tourism, and sources of aesthetic and spiritual beauty
- **supporting services**, such as soil formation, genetic diversity and habitats

Sadly 60% of the world's ecosystem services have been degraded in the last 50 years due to human activity. The world has witnessed water scarcity – two-thirds of cities in China now face water shortages – and the depletion of elements vital for business such as gold, silver, indium, iridium, tungsten, which are predicted to run out in five to fifty years.

And the rate of natural capital depletion is accelerating. We are using 50% more natural capital than the earth can replenish, according to WWF's *Living Planet Report* in 2012. As the global population continues to grow, and with it the need for energy, water and food, it has been estimated that by 2030 we will need the natural capital equivalent of two planets to sustain ourselves.<sup>1</sup>

## What is natural capital?

Natural capital refers to the elements of nature that produce value, directly and indirectly, to people, such as the stock of forests, rivers, land, minerals and oceans. It includes the living aspects of nature, such as fish stocks as well as the non-living aspects, such as minerals and energy resources. Natural capital underpins all other types of capital and is the foundation on which our economy, society and prosperity is built.<sup>2</sup>

*Natural Capital Committee for England*

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# RISKS AND OPPORTUNITIES FROM NATURAL CAPITAL DEPLETION

For businesses to be viable in the long term the natural resources and ecosystems they depend on must be maintained. It is crucial for organisations to understand these dependencies and impacts throughout their entire value chain, particularly in the upstream supply chain where on average 60% of environmental impact occurs.<sup>3</sup>

The World Resources Institute, World Business Council for Sustainable Development and Meridian Institute have identified five categories of corporate risk from natural capital issues – operational, market, reputational, regulatory and financing risks. Figure 1 includes examples of risks and opportunities some businesses are already experiencing.

The financial impact from these risks can include loss of revenue, reduced profitability and fall in share price. But organisations often fail to see the connection between the health of natural ecosystems and their bottom line. This is because measures of success, and the corporate systems that support these measures, are still largely dominated by financial metrics, short time horizons and a narrow view of business boundaries.

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For General Mills, nearly two-thirds of GHG emissions and 99% of water use occurred outside its own operations – reinforcing the importance of sustainable sourcing.

Trucost

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Where sustainability is on the radar of organisations, it often relates to ‘traditional’ sustainability measures such as waste or energy reduction because they are easier to track, easier to incorporate into existing management systems and easier to make a case for reducing. But this is only a small part of the sustainability picture. Organisations have an interconnected relationship with natural capital and rely on it to create value. They must therefore start to make the connection between natural capital, commercial opportunity and risks, and, ultimately financial performance. Understanding impacts, as well as dependencies on nature will help businesses mitigate risks and take advantage of new business opportunities linked to ecosystem change.

“Companies that understand their dependence on natural resources along the value chain are well placed to manage underlying risk from the rising cost of raw materials and scarcity of supply issues,” according to Dr. Richard Mattison, CEO of Trucost. “Companies are already facing increased input costs as a result of rising commodity prices related to climate change and water availability.”

FIGURE 1: Risks and opportunities from natural capital depletion

	Risk	Opportunity
Operational	<ul style="list-style-type: none"> <li>Limited or no access to raw materials and other inputs</li> <li>Increased prices for raw materials</li> <li>Price volatility</li> <li>Operational downtime</li> <li>Loss of productivity and output</li> <li>Increased insurance costs</li> </ul> <p>Costa Rican hydropower company <b>Energia Global</b> (now <b>Enel Latin America</b>) was literally losing its source of power in 1990s. Land owners were clearing the forested slopes upstream of the company's dams for livestock and agriculture. With the trees gone, heavy rains were causing increased soil erosion and river sedimentation, lowering dam reservoir capacity and power output.</p>	<ul style="list-style-type: none"> <li>Reduced costs</li> <li>Increased efficiency</li> <li>Low-impact industrial processes</li> </ul> <p><b>Mitsubishi Semiconductor America Inc</b> invested in water-saving technologies that reduced water use by 70% and wastewater effluent by 75%. This investment had a two-year payback.</p> <p><b>Clean Water Services</b>, a water utility company in Oregon US, saved US\$50m by using forests to regulate water temperature. In 2001, Oregon established maximum temperatures for discharge from wastewater-treatment plants. To meet the standards, Clean Water Services could have installed chillers to cool water discharge, at a cost of US\$102 to \$255 million. Instead, it planted trees along the river in addition to releasing water from nearby reservoirs, both of which contributed to lower river temperatures. The company calculates that the streamside shade helped avoid approximately US\$50 million in costs.</p>
Market & Product	<ul style="list-style-type: none"> <li>Changes in consumer preferences eg. for green products and companies</li> <li>Risk of loss due to market shifts to incorporate and address environmental impacts</li> </ul> <p>The UK government revised its wood procurement policies in 2004 to only purchase legally logged timber from sustainable sources. This had a significant impact on <b>Travis Perkins</b>, the country's largest supplier of building materials. With nearly 20% of its timber sales to government building projects, the company faced losing a sizeable share of business if it failed to meet these new customer preferences.</p> <p>When it comes to the environment <b>Unilever</b> works across the whole value chain – from the sourcing of raw materials to the way consumers use its products. Consumer use represents the largest impact on greenhouse gases which is why Unilever has targets to reduce greenhouse gas footprint impact per consumer use. Measures include educating consumers about 'greener' behaviours such as washing at lower temperatures, as well as reducing emissions in its own operations and new products to require less water or heat. However this has been challenging and Unilever's GHG footprint per consumer use increased by around 5% since 2010 and water use by 15%, according to Unilever's 2014 Sustainability Living Plan.<sup>4</sup></p>	<ul style="list-style-type: none"> <li>New products and services</li> <li>Markets for ecosystems services eg. carbon sequestration, watershed protection</li> <li>Markets for certified products eg. eco-labelled wood, seafood and other products</li> <li>New revenue from company-owned ecosystem</li> </ul> <p><b>Siemens</b> has expanded its portfolio of environmental products and services including wind farms, turbines for biomass plants and hydropower solutions. In 2013 its environmental portfolio generated €32bn, representing 43% of company revenues (up from 30% in 2011).<sup>5</sup></p> <p>Gas and electricity supplier, <b>Good Energy</b>, which generates all its electricity from renewables, has seen a leap in profits as dissatisfied UK customers switch from the large energy firms. Customer numbers rose 32% in 2013, and pre-tax profits more than doubled, to £3.3 million.<sup>6</sup></p> <p>Since 2008, <b>Unilever's</b> manufacturing eco-efficiency programme has used a number of cost-effective investments to reduce energy, water and waste, which have reduced the company's environmental footprint whilst avoiding cumulative supply chain costs of over €300m.<sup>7</sup></p>

	Risk	Opportunity
Reputational	<ul style="list-style-type: none"> <li>Increased scrutiny from investors on business use and impact on natural capital</li> <li>Reduced investment and commercial opportunities</li> <li>Damage to brand/reputation</li> <li>Challenges to 'license to operate'</li> </ul> <p>The forestry company <b>MacMillan Bloedel</b> suffered reputational damage when Greenpeace and others protested against the firm for clear-cutting forests. As a result of the protests, Scott Paper and Kimberly-Clark in the UK stopped sourcing from them, causing MacMillan Bloedel to quickly lose 5% of its revenue.</p>	<ul style="list-style-type: none"> <li>Differentiated brands</li> <li>Improved brand</li> </ul> <p><b>Fetzer Vineyards</b> – a division of <b>Brown-Forman</b>, the seventh largest wine manufacturer in the US – is differentiating its brand in the competitive wine industry by seeking to become “the sustainable” wine producer. The company uses cover crops to improve erosion control and attract natural predators to control pests.</p> <p><b>Levi Strauss</b> fears that water shortages caused by climate change may jeopardise the company’s very existence in the coming decades by making cotton too expensive or scarce due to water shortage. In the lifecycle of a pair of Levi’s® 501® jeans, the largest water impact comes from the cotton growing process and through the laundry habits of consumers. In response the Levi’s® Water&lt;Less™ collection was introduced that uses on average of 28% less water. It is also targeting consumer behaviour as almost 50% of the climate impact (generated by carbon dioxide emissions) of a pair of Levi’s® 501® jeans comes from how consumers wear and wash them. All jeans now have labels urging customers to wash less and use only cold water.<sup>8</sup></p>
Regulatory	<ul style="list-style-type: none"> <li>Increased environmental regulation and fines</li> <li>Quotas eg. fishing</li> <li>Extraction moratoria eg. logging bans</li> <li>User fees eg. water rights</li> <li>Introduction, suspension or denial of permits</li> </ul> <p><b>Union Pacific</b> was fined US\$102m for liabilities in a California forest fire in 2008. The judge ruled that Union Pacific was not only responsible for the cost of firefighting and lost timber, but also damage to young growth, soil, wildlife, habitat, recreational uses and views.</p> <p>The <b>BP</b> Deepwater Horizon disaster in the Gulf of Mexico in 2010 led to the death of 11 people and caused damage to nature and those earning a living from fishing and tourism-related businesses along the coast. In October 2013 BP had already incurred more than \$42bn of charges for cleanup costs, fines and compensation related to the spill.<sup>9</sup></p>	<ul style="list-style-type: none"> <li>License to expand operations</li> <li>New products or services to meet new regulations</li> <li>Opportunity to shape government policy</li> </ul> <p><b>Aggregate Industries UK</b> sought to develop a quarry on agricultural land. As part of the project it proposed a mix of wetlands for wildlife habitat and a lake for recreation. The cost-benefit analysis showed that the net benefit of the biodiversity, recreational and flood storage capacity of the wetland were worth £1.5m. In addition to increased profits, the plan helped the company maintain its license to operate.<sup>10</sup></p>
Financing	<ul style="list-style-type: none"> <li>More rigorous lending requirements</li> <li>Comply with lending standards</li> <li>More rigorous capital market standards</li> </ul> <p>The <b>Swiss National Bank</b> announced in January 2014 that it will sell off shares in companies that do not meet its ethical standards, including those that systematically cause grave damage to the environment.<sup>11</sup></p> <p><b>Investor environmental, social and governance requests</b> are on the rise according to a 2013 EY survey that reported that just under 40% of all shareholder proposals focus on environmental and social topics.<sup>12</sup></p>	<ul style="list-style-type: none"> <li>Markets for ecosystem services</li> <li>More favourable loan terms from banks for organisations that understand, mitigate and manage their environmental risks</li> </ul> <p><b>Beartooth Capital</b>, a US Montana-based private equity organisation, achieved significant ROI by selling or donating conservation easements on land it had restored to non-profits and the government (in return for tax breaks), and by selling mitigation credits.</p> <p>According to academic research, firms with strong corporate social responsibility (CSR) scores enjoy consistently <b>lower cost of capital financing</b> than firms with weaker CSR track records.<sup>13</sup></p>

Source: The Corporate Ecosystems Services Review<sup>14</sup> unless otherwise stated in the endnotes.



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# NATURAL CAPITAL ACCOUNTING IN BUSINESS

As the erosion of natural capital gathers pace, businesses that understand their relationship with nature will thrive: they will be ready to manage risks, and seize opportunities. Despite this, natural capital considerations are still largely invisible in decision making and corporate accounts.

Corporates must start considering the value of nature in all of their decision processes, and accounting for natural capital by measuring their dependencies and impacts on critical natural resources and ecosystems.

Natural capital information can then be used to inform strategic and operational decisions and in reporting.

**Strategy:** strategic planning, business model adaptation, assessing new market opportunities eg. ecosystem services.

**Management and operations:** responsible procurement and sourcing, identifying efficiencies, capital investment decisions eg. green infrastructure projects.

**Reporting:** internal management information and external reporting eg. integrated reporting, environmental profit and loss accounts.

**Investor information:** investor analysis on environmental, social and governance risks.

Accounting for natural capital can lead to a range of benefits including:

- improved security of supply
- more resilient supply chain and business model
- product and process innovation
- cost savings, revenue growth, stable future cash flows, reduced off-balance sheet liabilities
- product/process innovation
- new market opportunities and revenue streams eg. certified products, ecosystem services
- enhanced brand value
- reduced cost of capital
- tax breaks.

# HOW COMPANIES ARE ACCOUNTING FOR NATURE

## Puma – monetising environmental impacts

Some business leaders believe that the economic invisibility of nature has been a major reason for its degradation and that its decline will continue unless nature is given a financial value, and that value is incorporated into business thinking.

Puma, the sport lifestyle company, was the first organisation to monetise environmental impacts across its entire value chain when it produced an Environmental Profit and Loss Account (EP&L) in 2011.

“Placing a monetary value on our impacts – on natural services – has helped to illustrate the potentially negative impact depleted ecosystems can have on a businesses’ future performance ... .

The sustainability of business itself depends on the long-term availability of natural capital” Jochen Zeitz, CEO of Puma and Chief Sustainability Officer of PPR, in Puma’s Environmental Profit and Loss Account, 2011.

Puma has measured the impact of its water use, greenhouse gas emissions, land use and waste in its supply chain – from its own operations to raw materials production. To produce the EP&L a monetary value was calculated based on the changes in human welfare resulting from the organisation’s environmental impact.

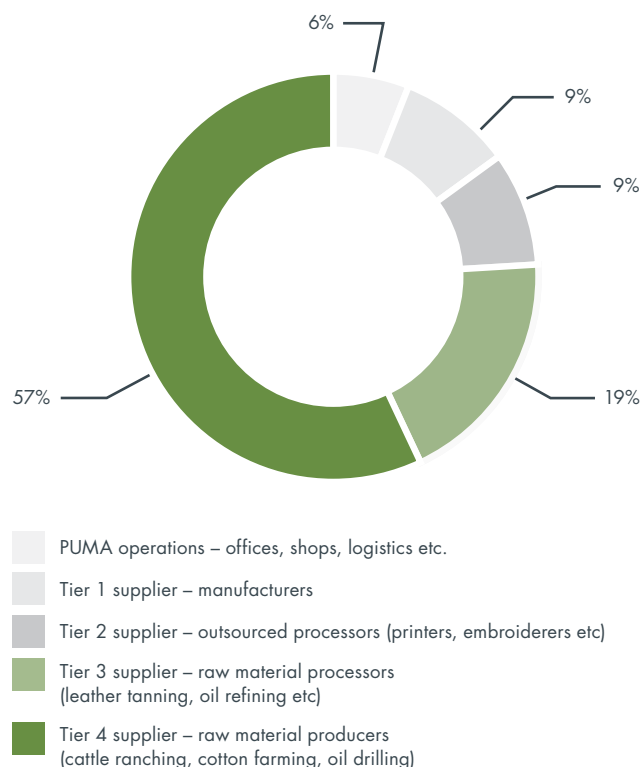
The EP&L revealed that Puma’s own operations accounted for only 6% of its environmental impacts. The vast majority of environmental impact (57%) was caused by the raw materials producers, such as the cattle ranchers that produce leather for shoes.

The EP&L approach has helped Puma identify risk ‘hot spots’ and direct management action to these areas. Monetising impacts has also helped facilitate better strategic planning. For example, Puma has been working closely with its manufacturers to reduce environmental impacts. It is also collaborating with companies further down the supply chain, looking for ways to allocate responsibilities and costs linked to water usage, and exploring new materials and products that are more water efficient.

Puma has also incorporated the EP&L results into budgeting, project portfolio and supply chain decisions. For example, when selecting new suppliers an assessment of the environmental impact of resource consumption in that region is considered, as well as more traditional criteria such as manufacturing performance, financial security, quality and cost.

Puma continues on its natural capital valuation journey, with its parent company, Kering, currently implementing an EP&L for its 21 luxury and sports brands with a view to producing a consolidated Group EP&L in 2016.

FIGURE 2: EP&L impact by supplier (%)



Source: Puma

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## Coca Cola – quantifying usage and replenishment rates

Some natural resources are renewable and therefore need time for stocks to replenish. For organisations reliant on renewable resources such as water they must have information on volume consumption and replenishment rates in order to maintain that valuable source of natural capital for years to come.

For The Coca Cola Company, water scarcity is a material risk affecting its business model. As a result it has, for many years, looked to improve how it manages water and conserves fresh water ecosystems.

The company has an ambitious target to safely replenish as much water as it uses in its beverages by 2020. To achieve this Coca Cola enlisted the Nature Conservancy to quantify the amount of water returned to nature and communities. The hundreds of local water watershed projects that Coca Cola has invested in were given ‘replenishment credits’. These credits were then counted against the volume of water used in its bottling plants. At the end of 2012, Coca Cola had replenished 52% of the water it used in its finished beverages.

Coca Cola is also working with its 863 bottling plants to implement a local water protection programme. It has asked the plants for reports on water quality and water scarcity evaluations, as well as an assessment of how their water use or wastewater discharge could impact on the local community and ecosystem. This will feed into a larger freshwater supply chain project assessing the vulnerabilities of the quality and quantity of its water sources.

## Dow Chemical Company – valuing natural capital services and infrastructure

Thinking about ecosystems and natural services in a more strategic way can open up new revenue streams or offer significant savings for business.

In 2011 Dow Chemical began a five year project to determine the business value of ecosystem services. The project was first piloted in their Texas site that included a wastewater treatment facility.

Dow’s Texan water treatment facility needed upgrading at a cost of US\$40m. Dow tested whether it was possible to construct a wetland to filter the waste water, instead of using a manufacturer solution. The constructed wetland cost a fraction of the price of the manufactured solution – only US\$1.5m. It also only took one year to complete and was fully operational within 18 months (project implementation time was reduced by half). It remains in full operation and not only meets all discharge requirements but has also eliminated algal bloom and the need to adjust the pH of the wastewater.

## Evolving standards but need for a harmonised approach

There are many excellent approaches and methodologies for managing and valuing nature in business. For example the **Corporate Ecosystems Services Review** that helps business managers develop strategies to manage risks and opportunities arising from ecosystem dependencies and impacts, and the **Guide to Corporate Ecosystem Valuation** – a framework for improving corporate decision making through the valuation of ecosystem services.

However, there is a growing demand for a harmonized approach for natural capital accounting and valuation. **The Natural Capital Coalition**, a multi-stakeholder initiative, is seeking to standardise how natural capital is accounted for and valued. In 2014 and 2015 the Coalition will work with partners to create and test a protocol for natural capital valuation. The work of the Coalition is supported by, among others, the World Bank’s International Finance Corporation, WBSCD and the accountancy profession – represented by CIMA, IFAC, ICAEW, EY, PWC, Accounting for Sustainability and others. This is an important initiative for the accountancy profession.

[www.naturalcapitalcoalition.org](http://www.naturalcapitalcoalition.org)

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# THE CFO AND FINANCE PROFESSIONAL'S ROLE IN NATURAL CAPITAL ACCOUNTING

Finance professionals, especially those in leadership roles, must raise and address natural capital issues in their organisations. In a recent report,<sup>15</sup> CIMA, in collaboration with EY, IFAC and the Natural Capital Coalition, identified how CFOs and management accountants can support the adoption of natural capital accounting in their organisations:

## 1. Raise natural capital as a strategic issue and make the business case for it

- Engage with natural capital as a strategic, competitive and financial issue at Board level and facilitate debate about how natural capital relates to your strategy, business model, performance outlook and social licence to operate.
- Frame the risks and opportunities that underpin natural capital impacts and dependencies in robust business terms, including how and over what time frames they may have an effect upon the business.
- Model business scenarios to facilitate dialogue around how these issues and uncertainties may unfold.
- Identify how natural capital impacts and dependencies can be incorporated into decision making at all levels so that the organisation can respond to the opportunities and risks which these may pose.

## 2. Measure and value

- Explore the most appropriate methodologies and help shape evolving standards for measuring and valuing your natural capital impacts and dependencies. Value can be assessed through non-monetary metrics or in monetary terms.
- Define the scope or boundary of measurement and valuation eg. your organisational footprint, supply chain or across the whole value chain.
- Engage with suppliers to understand better how the organisation is impacting on critical natural resources and to identify risk 'hot spots' in the value chain.

"Accountants have a crucial role to play in supporting the adoption of natural capital accounting in their organisations and ensuring that natural capital externalities are reflected in data collection, decision making, risk management and reporting. Change on this scale and of this substance requires more than a superficial response: it will only work if Corporate Boards integrate information about natural capital into strategic planning decision making and core business processes."

*Accounting for Natural Capital:  
the elephant in the boardroom, 2014*

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### 3. Use in decision making

- Prioritise those areas of the business where natural capital accounting will drive management action, such as strategic planning, risk and supply chain management, project and investment appraisal, governance and incentives, innovation and operational management.
- Adapt business processes and systems to incorporate natural capital considerations and information so that these can be embedded into decision making and reporting.
- Integrate material natural capital issues in both management information and integrated reporting to external stakeholders.

### 4. Influence the debate

- Establish links with international and professional organisations that are supporting the development of natural capital accounting, such as the Natural Capital Coalition's project to develop a protocol for valuing natural capital, to ensure your views are represented.

### 5. Develop relevant skills

- Build capacity in your team to enable natural capital accounting with the same rigour and discipline you would apply in accounting for financial performance.
- Forge relationships with stakeholders, relevant experts and specialists in this rapidly evolving area.

#### Further resources

This briefing is the last in a series exploring the extended value chain. To find out more, visit [cgma.org/valuechain](http://cgma.org/valuechain)

#### **Accounting for Natural Capital: the elephant in the boardroom**

A report from CIMA, EY, IFAC and the Natural Capital Coalition urging organisations to address natural capital issues.

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## Footnotes

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