

3D Profit and Loss accounting:

“Creating shared value across three dimensions”

Background documentation and justification of AkzoNobel 2016 annual report:

<http://report.akzonobel.com/2016/ar/sustainability/creating-shared-value-across-three-dimensions.html>

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Contents

Introduction	3
From 4D P&L to 3D P&L / approach	3
Sustainability along the value chain / scope	3
Results – AkzoNobel 2015	4
Detailed results:	5
Results Economic Capital:	5
Results Environmental capital:	5
Results Social capital	6
Creating value for society	6
Development needed to fully integrate the results	7
Economic capital	7
Methodology Economic capital	7
Main assumptions and data used for Economic capital calculations	8
Environmental capital	8
Methodology Environmental capital	8
Main assumptions and data used for Environmental capital calculations	9
Social capital	9
Methodology Social 1: Knowledge and skill development of employees	9
Main assumptions and data used Social 1: Knowledge development	10
Methodology Social 2: Costs related to LTI's	10
Main assumptions and data used Social 2: Costs related to LTI's	10

Introduction

The world is changing. And business is changing with it. Ratified in 2016, the Paris Agreement reached at COP21 commits the world to limiting global warming to 2 degrees – with a stretch goal of 1.5 degrees Celsius – setting legally binding targets on carbon emissions. In addition, the world began implementing the Sustainable Development Goals (SDGs) in 2016, which set the development agenda for the next 15 years.

As a result, leading businesses are accelerating to apply innovation, to solve societal development challenges and de-risk their value chains from increasing limitations on resource use and carbon emissions.

For AkzoNobel, these developments mean that creating shared value across three dimensions – economic, environmental and social – are considered opportunities to achieve sustained business success. We aim to making increasing use of economic, environmental and social impact assessment, as well as profit and loss accounting, as a driver for our decision making.

In order to better understand where we can have the biggest potential impact throughout our value chain, we have conducted a three-dimensional profit and loss (3D P&L) assessment across all our business activities. In other words: with a 3D P&L assessment, the impact of a company on society at large can be assessed.

In this report, you will find the detailed results of our 3D P&L Study for AkzoNobel, based on the year 2015. We start with the high-level results and move to a detailed explanation of the results by discussing the economic, environmental and social capital. Then we will explain our methodology and assumptions and finally you will find in the annex a case study where we have applied our 3D P&L model to an actual case of a paper book.

From 4D P&L to 3D P&L / approach

In our previous work, we have mentioned four dimensions: financial capital, natural capital, human capital and social risks. The social risk element of our previous 4D P&L work is not monetized so no actual profit and loss is calculated. Therefore, we have changed the name to 3D P&L to increase transparency. The 3D P&L encompasses the three pillars of sustainability: Economic capital, Environmental capital and Social capital.

Sustainability along the value chain / scope

The 3D P&L encompasses the three pillars of sustainability: Economic capital, Environmental capital and Social capital. The 3D P&L methodology takes into account not only our own company's costs and profit, but also the value creation (profits) and negative effects (losses) that take place in other links of the value chain, collectively called externalities.

Activities in the value chain are grouped into three main sections:

- Upstream; Raw material extraction, transportation of raw materials, production of intermediate materials, etc.
- Own operation; Emissions, energy use and waste treatment at sites of AkzoNobel

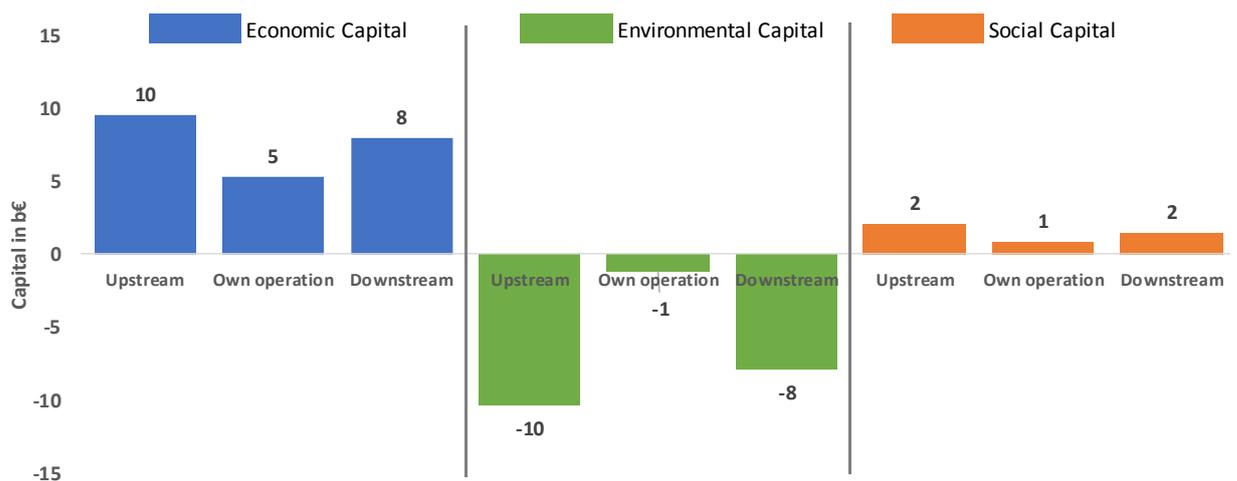
- Downstream; Impact on environment and nature during use and end-of-life of the products

These three sections are based on our AkzoNobel Carbon reporting scopes which in turn is based on the greenhouse gas protocol. Our study is fully in line with our carbon reporting scope plus an additional calculation for our downstream value creation and impacts.

Each of the three pillars of the 3D P&L framework is assessed with a separate methodology. The methodology for environmental capital was adopted from external approaches, whereas the ones for economic and social capital were newly established.

Results – AkzoNobel 2015

For 2015, the Economic capital, Environmental capital and Social capital of AkzoNobel is shown in Graph 1:

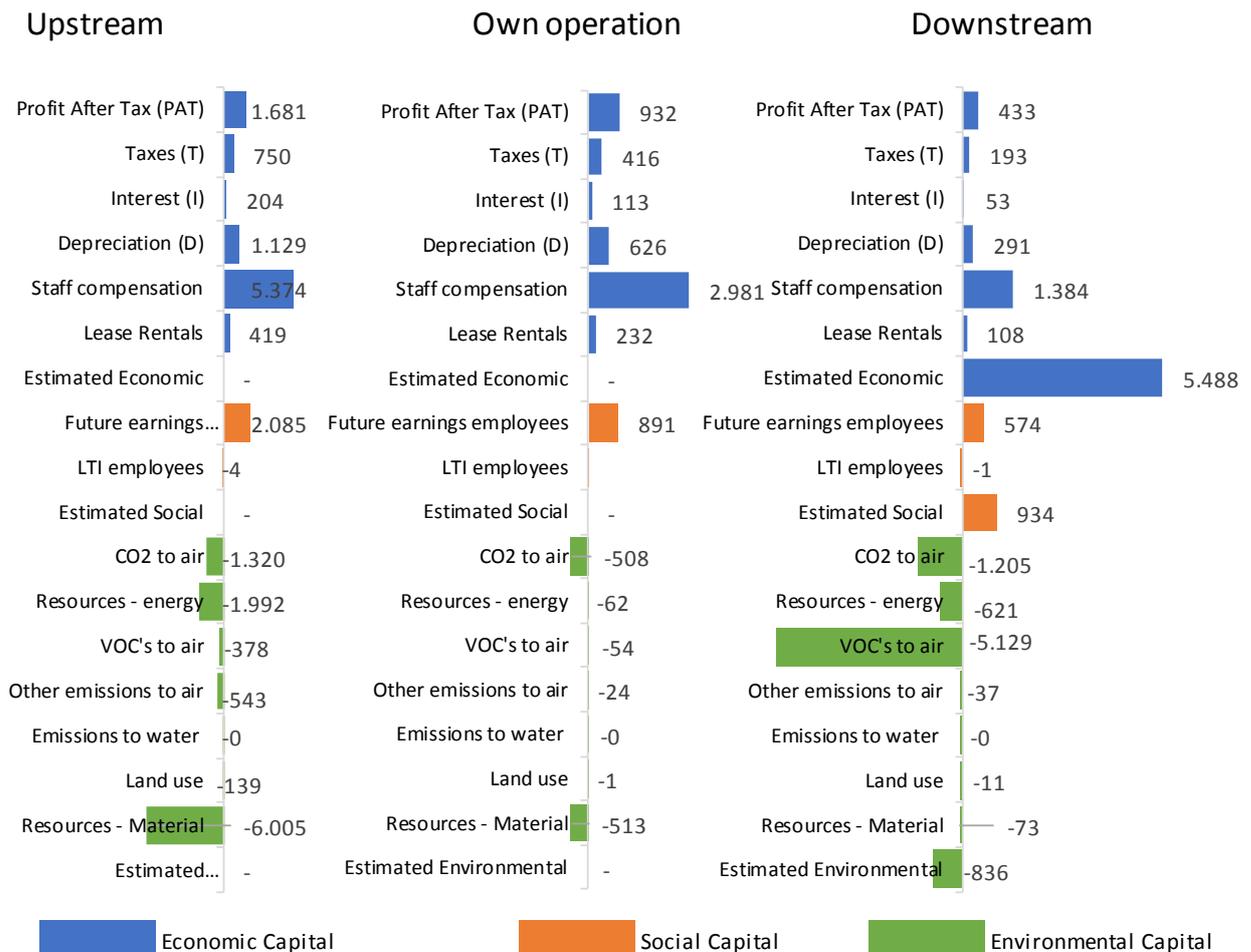


Graph 1: 3D P&L AkzoNobel 2015

This overview gives us an immediate reality check of the AkzoNobel business where it creates value and where we have a negative impact. We create a lot of value both in the economic dimension and the limited aspects considered in the social dimension, the big negative impacts are related to the environmental impacts we have. This shows more than just our own company. This perspective includes our upstream, our direct suppliers and their suppliers, as well as our downstream, our customers and their customers. Our direct contribution is measured from an economic and social perspective is about 20% of the total value chain and from an environmental perspective it about 6%. Yet, even if only 6 to 20% if in our direct control, we are impacted by the full 100%. Therefore this graph also highlights that addressing these impacts will clearly be a value chain effort and that we cannot do this without a combine effort with our suppliers and customers.

Detailed results:

If we analyze the underlying elements we get the overview as shown below in graph 2. In blue, you can find elements summing up to the economic capital. In orange the elements summing up to the social capital and in green the elements summing up to the environment capital.



Graph 2: Detailed split 3D P&L AkzoNobel 2015

Results Economic Capital:

AkzoNobel has created in combination with its value chain partners around 24 €bn of value. The main contributor are the wages to all the people employed in our industries (the staff compensation). Additional contributions are the tax revenue for the government, interest for investors and profit for shareholders and costs related to the use of capital good such as depreciation and lease rentals. The sum of these values is referred to as 'Economic capital'.

Results Environmental capital:

Our business activities have an impact on the environment and nature. We have quantified the environmental burden and natural cost associated with our business activities and attached a monetary value to these impacts. The key contributors are our CO₂ emissions,

fossil resource use, VOC emissions and material resources. The data was generated using life cycle assessment of our value chains. We have used a complete, robust pricing model which is based on a long-term perspective. As a result, we used prices that are not representative for the prices today, but based on what would happen in 50 to 100 years if we keep on using nature as we do today. For example using a price of 135€ per ton of emitted CO₂. Overall this results a negative environmental capital of 19 €bln. The key impacts on nature occur in our upstream and downstream activities, rather than our own processes.

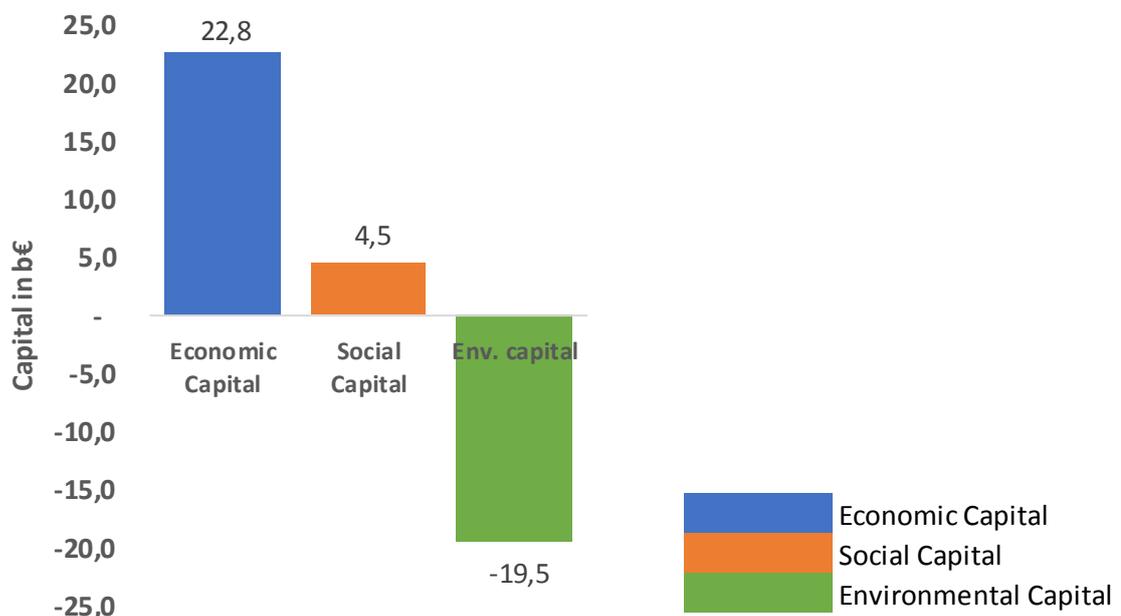
Results Social capital

In total, we have created a positive social capital of 4,3€bln along the value chain. This is mainly related to the knowledge and skill development of employees, which is measured through future salary development. The negative impact is related to the injuries at work of employees along our value chain is minus 6 m€.

The coverage of topics taken into account for social capital is currently limited. We feel that a lot of these topics such as human rights management violations or child labor should not be monetized because it is never acceptable in our value chains (not at any price). But we will continue to include other social impacts, for example our community program, Human Cities and other topics we will identify.

Creating value for society

If we summarize the results and combine the three types of capitals into one graph (graph 3) it is clear that we create along with our value chain partners a large value for society, even if we include the long term environmental capital costs. At the same time this shows that we cannot continue to work like this forever, which clearly underpins all the efforts we do to reduce our resource use (REI), CO₂ emissions and VOC emissions.



Graph 3: Summary 3D P&L AkzoNobel 2015

Development needed to fully integrate the results

In order to create our 3D P&L, we have used the latest methods available and we have tested and developed our approach over the last 3 years. We have always used scientific, publicly available methodologies. The 3D P&L assessments are therefore robust and repeatable. Still we are at a very early stage of monetizing and impact measuring, not just AkzoNobel, but as a society in general.

This means that to fully digest and understand these results, we will continue to work on improving the approach and map additional impacts that are both positive and negative. By expanding and developing the methodology, our results will change over time, through improvements to our own performance as well as through the addition of more elements.

We currently cooperate in the development of for example the natural and social capital protocol, in the World Business Council for Sustainable Development. We encourage others to work with us to further develop methodologies and agree on common approaches.

More details about the methodologies and background assumptions on each of the three dimensions can be found in the following sections: Economic capital, Environmental capital and Social capital.

Economic capital

Economic capital quantifies the positive financial externalities of operating a company. This consists of more than the profit, as companies create economic value in many different ways: they generate wages for their employees, tax revenue for the government, interest for their investors and profit that is shared with their shareholders.

Methodology Economic capital

The sum of the economic gains to society is called ‘economic capital’, which we define as the Value Added:

$$\text{Value added} = \text{Profit after tax} + \text{Taxes} + \text{Interest} + \text{Depreciation} + \text{Lease rentals} + \text{Staff compensation}$$

Value Added items	Contribution
Profit (After Tax)	Revenues to shareholder & new investments
Taxes	Contribution to governmental budgets
Interest	Compensation for providers of (operating) capital
Depreciation	Replacement cost of capital goods
Lease Rentals	Cost of hiring capital goods

Staff compensation Total compensation to employees in the form of wages and other compensation

Value Added items. Reference: *Financial capital creation along the value chain (Ecomatters, 2016).*
www.ecomatters.nl/financial-capital

Main assumptions and data used for Economic capital calculations

Upstream: The total value created upstream is equal to the total revenue of AkzoNobel in 2015 minus the economic capital created by AkzoNobel in the own operations. We assume that the suppliers of AkzoNobel generate economic value to the society in a similar way as AkzoNobel (the split between staff compensation, taxes, profit etc.) as most of them are companies within the chemical sector. Therefore, the economic capital created of AkzoNobel is taken as the basis for the upstream companies.

Own operations: The data from AkzoNobel's own operations come directly from the financial reporting and is consolidated on BU level.

Downstream: The downstream consists of 2 elements:

1. The value created directly based on specific properties of our product value chains. For example: if the coating is cured by our customer. This process step is directly related to our product, and we report the environmental impacts of these activities in the downstream of our carbon reporting. As we are aware of these impacts we can also assess the economic implications.
2. The value created indirectly based on our products. For example: if our paint is sold in a shop, we know that the retailer creates value with our product. This is not directly a product property, so we do not track this activity in our carbon reporting models. We do create a lot of value and want to capture this value in our assessment. Therefore, we have estimated the economic, environmental and social capital effects of these activities. In our result overview, you will find these elements under the estimated Economic, social and environmental. We track this as estimated, as we are still exploring these elements further since we have not reported on them before, in our carbon reporting.

Environmental capital

Environmental capital covers the impact our business activities have on the environment and nature. They lead to, among others, fossil fuel consumption, greenhouse gases emission (collectively expressed as carbon dioxide equivalents, CO₂ eq.) and waste produced.

Methodology Environmental capital

We have quantified the environmental burden and natural cost associated with our business activities and attached a monetary value to these impacts.

This results in what we call our 'environmental capital', which we define as:

$$\text{Cost to nature} = \text{impact on nature} \times \text{monetary value of the impact}$$

Schematically, the way in which environmental capital is calculated is:

$$\begin{array}{|c|} \hline \text{CO}_2 \text{ emission} \\ \hline \text{(e.g. 10 kg)} \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Cost / kg CO}_2 \\ \hline \text{(e.g. -€ 0,135 / kg)} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Environmental capital} \\ \hline \text{related to CO}_2 \\ \hline \text{(e.g. -€ 1,35)} \\ \hline \end{array}$$

The impact on nature is based on the actual emissions and resource extraction. To quantify the impact, Life Cycle Assessment (LCA) is used.

The monetary value we have subsequently attached to the quantified environmental impacts is in accordance with the price for impact as established in the Environmental Priority Strategy (EPS) 2015dx, a methodology developed by Chalmers University (www.ivl.se/eps). The monetary values in this EPS method are based on either real or hypothetical market values, and reflect the cost of either environmental remediation or resource replacement.

We have used a complete, publicly available and robust pricing model which is based on a long term perspective. As a result, we used prices that are not representative for the prices today, but based on what would happen in 50 to 100 years if we keep on using nature as we do today (for example using a price of 135€ per ton of emitted CO₂).

Main assumptions and data used for Environmental capital calculations

AkzoNobel is using LCA for over 20 years now for internal decision making and carbon foot reporting. We have used the available models for the calculations in our own operations and the upstream use of raw materials and downstream emissions related to our products. This work is based on the assessment of over 300 product value chains. These models have been the basis of our carbon reporting in the last years both our upstream as well as our downstream is captured in these models. They are now utilized to create the LCA results needed to calculate the environmental capital costs. We combine our LCA models with our actual site emissions to calculate the impacts of our own sites.

Social capital

A variety of social impacts may occur in a company or industry, which can be related to either employees, consumers and/or local communities. Examples include knowledge development, but also serious topics such as health and safety, child labour and discrimination.

In the current Social capital assessment, the social capital metric is related to the knowledge and skill development (or degradation) of employees, as well as costs related to Lost Time Injuries (LTI).

Methodology Social 1: Knowledge and skill development of employees

Knowledge and skill development quantifies the financial externalities of future income of employees based on the current experience due to working for the company. It reflects the positive or negative impact of this development on employee's future salary development. This is therefore defined as 'expected value of future earnings':

$$\begin{aligned}
 & \text{Expected value of future earnings} \\
 & = \text{current staff compensation} \times \text{inflation corrected wage development} \\
 & \times \text{time till retirement} \times \text{fraction of compensation related to work}
 \end{aligned}$$

www.ecomatters.nl/human-capital

Main assumptions and data used Social 1: Knowledge development

Current staff compensation: Input data based on element “staff compensation” as collected in Economic Capital Assessment

Inflation corrected wage development: Based on linear extrapolation using long term (>10 years) inflation and salary increase data. Average industry and country situation, data represents all levels of staff employed. These datasets from statistic bureaus of the main countries where AkzoNobel operates. These countries publish both their inflation data as well as their wage developments.

Time till retirement: It is expected that on average employees still need to work 20 years until retirement

Fraction of compensation related to work: 75% of salary development is directly related to the work of the employee in his job. The other 25% is assumed to related to other personal development outside of work.

Methodology Social 2: Costs related to LTI’s

To define the “Costs” based on Lost Time Injuries (LTI), we defined the impact on the individual’s quality of life from injuries and the impact for loss of life. This is based on the ‘financial’ costs, such as loss of production due to absence from work, and healthcare costs.

$$Cost\ for\ LTI = Quantity \times Unit\ price$$

Quantity is the number of workplace injury cases, by severity category and *Unit Price* is the appropriate monetary value per case for each specific impact accounted for in the model.

To determine the Unit Price, data from the Health and Safety Executive national body in UK is taken as basis and we use the total cost as provided in the table below and applied this costing model to all the incidents as reported (including 3rd party contractors). This was deemed a conservative approach, taking all incidents into account, taking costs related to the UK, which we consider at the high end of the cost range taking into account that AkzoNobel has operations around the world. We have applied one cost, regardless where the accident has taken place, we do not want to discriminate on region.

	Total costs (rounded)
Non-fatal injuries	7,400
7 or more days absence	28,484
Up to 6 days absence	880

Main assumptions and data used Social 2: Costs related to LTI’s

LTI are measured within AkzoNobel and we have categorized them into 2 categories (7 or more days & up to 6), according the number of incidents based on information from our Incident Reporting System. After multiplying with the costs, we came to a total cost of 1,7 m€

for our own operations. As we did not have specific incident data available for upstream and downstream we assumed that in our upstream and downstream we have the same number of incidents per euro of Staff compensation paid as we have within AkzoNobel. As the staff compensation is available from Economic Capital calculations we calculated a total negative social cost related to incidents for the total value chain is 6 M€.