

iPlan

v.3.6 – 2017

Phidias case

Giorgio Di Maio & Paolo Landoni © 2014-2017
giorgiodimaio@gmail.com - paolo.landoni@polito.it



SIT

social innovation teams

iPlan – Phidias case

July 2017

PHIDIAS S.R.L.	3
1. FINANCIAL ASSUMPTIONS - WORKSHEET 1.1	5
2. MARKET VOLUMES - WORKSHEET 1.2	6
3. MARKETS REVENUES - WORKSHEET 1.3	7
4. OTHER TAXABLE REVENUES - WORKSHEET 1.4.....	7
5. NOT TAXABLE REVENUES - WORKSHEET 1.5	8
6. INVESTMENTS - WORKSHEET 1.6.....	8
7. FIXED COSTS - WORKSHEET 1.7	8
8. VARIABLE COSTS - WORKSHEET 1.8.....	9
9. FREEHAND - WORKSHEET 1.9	10
10. TERMINAL VALUE - WORKSHEET 1.11	10
11. FINANCIAL NEED – WORKSHEET 3.10.....	10
12. FINANCIAL NEED – WORKSHEET 2.1	11
13. FINANCIAL NEED – WORKSHEET 1.1	11
14. CAPITAL CONTRIBUTIONS – WORKSHEET 1.1	11
15. CASH BALANCE – WORKSHEET 2.5	12
16. NET EARNINGS – WORKSHEET 3.7	12
17. DIVIDENDS - WORKSHEET 1.10.....	13
18. FINANCIAL STATEMENTS - WORKSHEET 2.2	13
19. NET PRESENT VALUE AND INTERNAL RATE OF RETURN - WORKSHEET 2.2	15
20. NET PRESENT VALUE AND INTERNAL RATE OF RETURN - WORKSHEET 3.11	15

PHIDIAS S.R.L.

Phidias is an Italian company that wants to start a business in the field of 3D printing, with the establishment of a new for-profit company wholly owned by Phidias that will be named “Phidias 3D printing”.

Thus, the firm is preparing the business plan for this activity, using the software iPlan, with a time horizon of 5 years, starting in January 2018.

Phidias assumes an exchange rate EUR/USD of 0.8130 in the period considered. Other assumptions are a tax rate equal to 50% of the earnings and that annual taxes are paid on December 31.

Phidias operates only on the Italian market.

Phidias estimates an Italian *potential market* of 50,000 units in 2018, with a growth rate of 10% in the second year, 20% in the third, 30% in the quarter and 40% in the fifth. The firm estimates that its *available market* will be half the potential market in the time horizon considered. The *served market* will be 10% in the first year, 30% in 2019 and 2020 and 50% in 2021 and 2022. Phidias estimates a *penetrated market* equal to 30% of the served market from the month of April 2018, after a marketing campaign done in the months from January to March.

Phidias estimates an average revenue per unit of 150 euro per piece in 2018. The average revenue per unit will decrease in subsequent years of 10% per year.

Phidias will have two orders in June 2018 and July 2018 for which estimates a revenue, net of variable production costs, amounting to 2,000 and 4,000 euro.

Phidias will receive a grant of 5,000 euro from the local chamber of commerce, after 6 months of operation, i.e., in July 2018.

Phidias plans to buy three 3D printers in January 2018. They cost respectively 15,000, 26,000 and 35,000 euro. Phidias will pay the 3D printers in the same month.

The 3D printers have a fiscal depreciation coefficient equal to 30%.

Phidias plans to rent a laboratory for the activity, starting on January 2018, for a total cost equal to 1,500 euro per month. Phidias expects that this cost will be constant over time. The firm will pay the rent in advance with quarterly installments.

Phidias will also pay other fixed expenses related to the laboratory, equal to 500 euro, with monthly installments.

Phidias plans to hire 2 persons in January 2018, and 2 in January 2019.

The annual cost of each employee, including both salary and taxes, is 29,400 euro and the firm estimates that it will be constant over time. Therefore, the monthly labor costs will be equal to 4,900 euro in 2018 and to 9,800 euro from January 2019 onwards.

Furthermore, Phidias estimates that will have to bear an additional expense for general services of 50 euro per month for each employee.

Phidias estimates an average cost of production, net of labor costs, amounting to 40 euro per piece in 2018, which will decrease in subsequent years of 10% per year.

Phidias plans to import from the United States, and sell on the domestic market, 200 kilograms per month of wires for 3D printers. Whereas the purchase cost is 40 USD/kg, the revenue is 55 EUR/Kg. Phidias expects that this activity will only last from June 2018 to December 2018.

At the end of the Business Plan's time horizon, the business operations will continue for one year, with the same net earnings of the last year of the business plan's time horizon. At the end of this year, Phidias will cease the business operations in this field, and liquidate the new company with a revenue of 105,000 euro. Phidias have estimated this terminal value considering the cash balance and the revenues after taxes from the sale of the company's assets.

Based on these data, Phidias wants to understand the profitability (feasibility) of the business, assuming a discount rate equal to 60%, and the capital needed to start it.

1. FINANCIAL ASSUMPTIONS - WORKSHEET 1.1

Phidias is an Italian company that wants to start a business in the field of 3D printing, with the establishment of a new for-profit company wholly owned by Phidias that will be named "Phidias 3D printing".

Company		
Name	Phidias 3D printing	
Type	For-profit organization	

Thus, the firm is preparing the business plan for this activity, using the software iPlan, with a time horizon of 5 years, starting in January 2018.

At the end of this time horizon, Phidias will cease the business operations in this field, and liquidate the new company.

Business Plan's Time Horizon		
Start Year	(yyyy)	2018
Start Month	(mm)	1
Start Date		01/01/2018
Start Month	(mm/yyyy)	1/2018
Time horizon	Years	5
Last year in the business plan's time horizon		2022

Phidias assumes an exchange rate EUR/USD of 0.8130 in the period considered.

Currency			
Home Currency		EUR	
Foreign Currency		USD	
Exchange Rates		1/2018	
	How many EUR for one USD	EUR/USD	0,8130
	How many USD for one EUR	USD/EUR	1,2300

Other assumptions are a tax rate equal to 50% of the earnings and that annual taxes are paid on December 31.

Taxation		
Tax Rate	%	50%
Tax Day	(dd/mm)	31/12

2. MARKET VOLUMES - WORKSHEET 1.2

Phidias operates only in the Italian market.

Phidias estimates an Italian potential market of 50,000 units in 2018, with a growth rate of 10% in the second year, 20% in the third, 30% in the quarter and 40% in the fifth.

Markets		
	Market Name	Unit of measure
Market 1	Italian Market	Pieces

Market 1 - Italian Market				
Market 1 - Potential Market				
Period description	Growth rate	[by month]	(to month)	Annual Volume
1st year		1/2018	1/2019	50.000
2nd year	10,0%	1/2019	1/2020	55.000,00
3rd year	20,0%	1/2020	1/2021	66.000,00
4th year	30,0%	1/2021	1/2022	85.800,00
5th year	40,0%	1/2022		120.120,00

The firm estimates that its available market will be half the potential market in the time horizon considered.

Market 1 - Available Market			
Period description	[by month]	(to month)	% of the Potential
All the time horizon	1/2018		50,0%

The market served will be 10% in the first year, 30% in 2019 and 2020, and 50% in 2021 and 2022.

Market 1 - Served Market			
Period description	[by month]	(to month)	% of the Available
1st year	1/2018	1/2019	10,0%
2nd and 3rd years	1/2019	1/2021	30,0%
4th and 5th years	1/2021		50,0%

Phidias estimates a penetrated market equal to 30% of the market served from the month of April 2018, and null until March 2018.

Market 1 - Penetrated Market			
Period description	[by month]	(to month)	% of the Served
January-March of the first year	1/2018	4/2018	0,0%
Since April of the first year onward	4/2018		30,0%

3. MARKETS REVENUES - WORKSHEET 1.3

Phidias estimates an average revenue per unit of 150 euro per piece in 2018.

Starting Revenues per Unit			
	Market	Revenues per Unit	Currency
Market 1	Italian Market	150,00	EUR

The average revenue per unit will decrease in subsequent years of 10% per year.

Market 1 - Italian Market				
Revenues per Unit				Monthly Volumes
Period description	Growth Rate	[by month]	(to month)	Revenues per Unit
1st year		1/2018	1/2019	150,00
2nd year	-10,0%	1/2019	1/2020	135,00
3rd year	-10,0%	1/2020	1/2021	121,50
4th year	-10,0%	1/2021	1/2022	109,35
5th year	-10,0%	1/2022		98,42

4. OTHER TAXABLE REVENUES - WORKSHEET 1.4

Phidias will have two orders in June 2018 and July 2018 for which it estimates a revenue, net of variable production costs, amounting to 2,000 and 4,000 euro.

Fixed Revenues with a due date			
Description	Due date	Amount	Currency
1st initial order	01/06/2018	2.000,00	EUR
2nd initial order	01/07/2018	4.000,00	EUR

5. NOT TAXABLE REVENUES - WORKSHEET 1.5

Phidias will receive a grant, net of taxes, of 5,000 euro from the local chamber of commerce, after 6 months of operation, i.e. in July 2018.

Fixed Revenues with a due date			
Description	Due date	Amount	Currency
Grant from the chamber of commerce	01/07/2018	5.000,00	EUR

6. INVESTMENTS - WORKSHEET 1.6

Phidias plans to buy three 3D printers in January 2018. They cost respectively 15,000, 26,000 and 35,000 euro. Phidias will pay the 3D printers in the same month.

The 3D printers have a fiscal depreciation coefficient equal to 30%.

Investments				
Description	Date	Depreciation coefficient *	Amount	Currency
3D printer	01/01/2018	30%	15.000,00	EUR
3D printer	01/01/2018	30%	26.000,00	EUR
3D printer	01/01/2018	30%	35.000,00	EUR

7. FIXED COSTS - WORKSHEET 1.7

Phidias plans to rent a laboratory for the activity, starting on January 2018, for a total cost equal to 1,500 euro per month. Phidias expects that this cost will be constant over time. The firm will pay the rent in advance with quarterly installments.

Phidias will also pay other fixed expenses related to the laboratory, equal to 500 euro, with monthly installments.

Phidias plans to hire 2 persons in January 2018, and 2 in January 2019.

The annual cost of each employee, including both salary and taxes, is 29,400 euro and the firm estimates that it will be constant over time. Therefore, the monthly labor costs will be equal to 4,900 euro in 2018 and to 9,800 euro from January 2019 onwards.

Fixed Periodic Costs

Description	Frequency	Starting month	Starting date	Amount	Currency
Laboratory rent	3	1	01/01/2018	1.500,00	EUR
Laboratory other fixed expenses	1	1	01/01/2018	500,00	EUR
Labor costs - first 2 employees	1	1	01/01/2018	4.900,00	EUR
Labor costs - 2 additional employees	1	1	01/01/2019	4.900,00	EUR

Furthermore, Phidias estimates that will have to bear an additional expense for general services of 50 euro per month for each employee.

Fixed Costs Drivers

Fixed Costs Driver 1

Employees

Period description	[by month]	(to month)	Value
1st year	1/2018	1/2019	2
From the 2nd year onwards	1/2019		4

Fixed Costs with a Driver

Description	Driver	[by month]	(to month)	Cost per unit	Currency
General services	1	1/2018		50,00	EUR

8. VARIABLE COSTS - WORKSHEET 1.8

Phidias estimates an average cost of production, net of labor costs, amounting to 40 euro per piece in 2018, which will decrease in subsequent years of 10% per year.

Costs Variable with Markets Volumes

Description	Market	[by month]	(to month)	Cost per unit	Currency
Average production cost - 1st year	1	1/2018	1/2019	40,00	EUR
Average production cost - 2nd year	1	1/2019	1/2020	36,00	EUR
Average production cost - 3rd year	1	1/2020	1/2021	32,40	EUR
Average production cost - 4th year	1	1/2021	1/2022	29,16	EUR
Average production cost - 5th year	1	1/2022	1/2023	26,24	EUR

9. FREEHAND - WORKSHEET 1.9

Phidias plans to import from the United States, and sell on the domestic market, 200 kilograms per month of wires for 3D printers. Whereas the purchase cost is 40 USD/kg, the revenue is 55 EUR/Kg. Phidias expects that this activity will only last from June 2018 to December 2018.

Item 1	Wires for 3D printers (Kg)	6/2018	7/2018	8/2018	9/2018	10/2018	11/2018	12/2018
Sales per month (units)		200,00	200,00	200,00	200,00	200,00	200,00	200,00
Selling Currency	EUR							
Revenues per unit (EUR per unit)		55,00	55,00	55,00	55,00	55,00	55,00	55,00
Revenues per month (EUR)		11.000,00	11.000,00	11.000,00	11.000,00	11.000,00	11.000,00	11.000,00
Exchange rate	EUR/EUR							
Revenues per month (EUR)		11.000,00	11.000,00	11.000,00	11.000,00	11.000,00	11.000,00	11.000,00
Purchases per month (units)		200,00	200,00	200,00	200,00	200,00	200,00	200,00
Purchases Currency	USD							
Purchases price (USD per unit)		40,00	40,00	40,00	40,00	40,00	40,00	40,00
Purchases per month (USD)		8.000,00	8.000,00	8.000,00	8.000,00	8.000,00	8.000,00	8.000,00
Exchange rate	EUR/USD							
Purchases per month (EUR)		6.504,00	6.504,00	6.504,00	6.504,00	6.504,00	6.504,00	6.504,00
Margin (EUR)		4.496,00	4.496,00	4.496,00	4.496,00	4.496,00	4.496,00	4.496,00

10. TERMINAL VALUE - WORKSHEET 1.11

At the end of the Business Plan's time horizon, the business operations will continue for one year, with the same net earnings of the last year of the business plan's time horizon. At the end of this year, Phidias will cease the business operations in this field, and liquidate the new company with a revenue of 105,000 euro. Phidias have estimated this terminal value considering the cash balance and the revenues after taxes from the sale of the company's assets.

Business operations beyond the Business Plan's time horizon and final selling or liquidation of the business activity	
Last year in the business plan's time horizon	2022
Terminal year (at the end of this year, the business activity is sold or liquidated)	2023
Number of years between the last year of the business plan's time horizon and the terminal year	1
Net earnings in the last year of the business plan's time horizon, 2022	259.094
Constant annual growth rate of the net earnings in the period 2023-2023	0%
Selling price or liquidation value of the business activity at the end of 2023	105.000

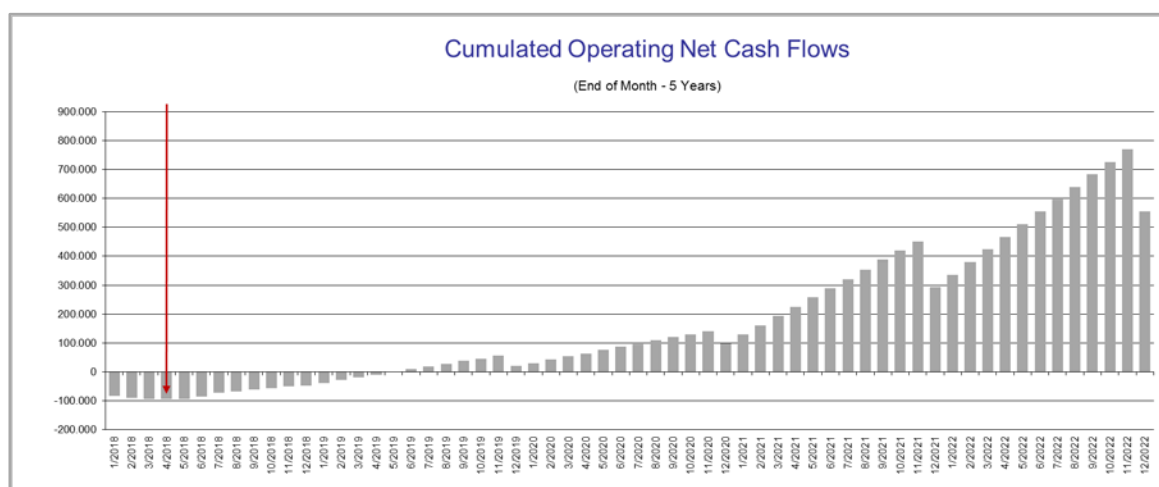
11. FINANCIAL NEED – WORKSHEET 3.10

Based on these data, Phidias calculated using iPlan, the monthly-cumulated operating net cash flows, which show a financial need equal to 94.125 euro (worksheet 3.10 Operating Cash Flows).

Financial Need	-94.125,00
(Minimum Cumulated Net Cash Flows)	

12. FINANCIAL NEED – WORKSHEET 2.1

The financial need is also shown by the chart of the monthly-cumulated operating net cash flows (worksheet 2.1 Cumulated Operating Net Cash Flows).



13. FINANCIAL NEED – WORKSHEET 1.1

The financial need appears also in the first worksheet, 1.1 Data.

Financial Need		
Financial Need	Euro	-94.125,00

14. CAPITAL CONTRIBUTIONS – WORKSHEET 1.1

Phidias will cover this financial need investing an initial capital equal to 20,000 euro.

Moreover, Phidias will contribute a second round of capital in late January 2018, investing 80,000 euro.

Capital contributions		Amount	Period	
1 st Round - Initial capital	EUR	20.000,00	1/2018	T=0
2 nd Round	EUR	80.000,00	1/2018	

Phidias will not resort to debt.

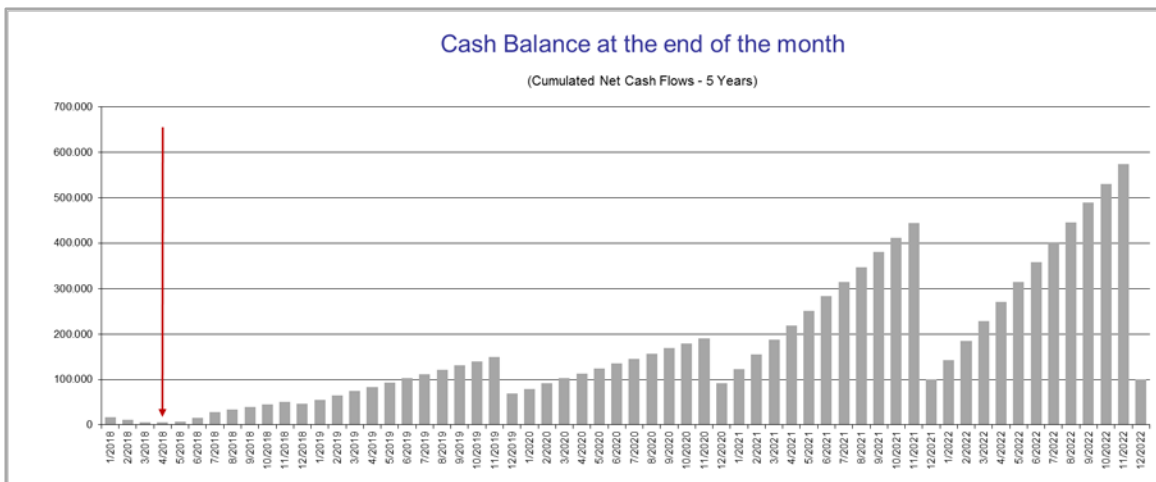
Debt	
Use of the Bank Overdraft?	No
Use of the Mortgage?	No

Thus, the activity will have a buffer of 5,875 euro (the Financial Need with Capital contributions is positive). The buffer is the minimum amount of cash that the company will reach.

Financial Need		
Financial Need	EUR	-94.125,00
Financial Need with Capital contributions	EUR	5.875,00

15. CASH BALANCE – WORKSHEET 2.5

Worksheet 2.5 shows that Phidias will reach the minimum amount of cash in April 2018.



16. NET EARNINGS – WORKSHEET 3.7

Based on these data, Phidias expects to be able to achieve the following net earnings in the time horizon 2018-2022 (worksheet 3.7 Income statements & Taxes).

Income Statements					
	2018	2019	2020	2021	2022
Taxable Revenues	167.375,00	334.125,00	360.855,00	703.667,16	886.620,72
Not Taxable Revenues	5.000,00	0,00	0,00	0,00	0,00
Revenues	172.375,00	334.125,00	360.855,00	703.667,16	886.620,72
Costs and Expenses	-140.028,00	-221.100,00	-228.228,00	-319.644,60	-368.432,20
EBITDA	32.347,00	113.025,00	132.627,00	384.022,56	518.188,52
Depreciations & Amortizations	-22.800,00	-22.800,00	-22.800,00	-7.600,00	0,00
EBIT	9.547,00	90.225,00	109.827,00	376.422,56	518.188,52
Interests	0,00	0,00	0,00	0,00	0,00
Earnings Before Taxes	9.547,00	90.225,00	109.827,00	376.422,56	518.188,52
Taxes	-2.273,50	-45.112,50	-54.913,50	-188.211,28	-259.094,26
Net Earnings	7.273,50	45.112,50	54.913,50	188.211,28	259.094,26

17. DIVIDENDS - WORKSHEET 1.10

Phidias assumes that the net earnings are paid as dividends at the end of each year.

Dividend Policy						
Financial Need with Capital contributions and Debt			5.875,00			
Financial Need with Capital contributions, Debt and Dividends			5.875,00			
Year	Retained earnings at the end of the previous year	Net Earnings of the year	Max Dividend of the year	Dividend of the year	Payment Date	Retained earnings at the end of the year
2018		7.273,50	7.273,50	7.273,50	31/12/2018	0,00
2019	0,00	45.112,50	45.112,50	45.112,50	31/12/2019	0,00
2020	0,00	54.913,50	54.913,50	54.913,50	31/12/2020	0,00
2021	0,00	188.211,28	188.211,28	188.211,28	31/12/2021	0,00
2022	0,00	259.094,26	259.094,26	259.094,26	31/12/2022	0,00

18. FINANCIAL STATEMENTS - WORKSHEET 2.2

Phidias can thus estimate the financial statements of the business, i.e. the balance sheet, income statement and statement of cash flows for the period 2018-2023 (worksheet 2.2 Financial Statements and Indicators).

Balance Sheet

	2018	2019	2020	2021	2022	2023
LIABILITIES						
Capital	100.000	100.000	100.000	100.000	100.000	100.000
Retained Earnings	0	0	0	0	0	0
Equity	100.000	100.000	100.000	100.000	100.000	100.000
Bank Overdraft	0	0	0	0	0	0
Mortgage	0	0	0	0	0	0
Debt	0	0	0	0	0	0
TOTAL LIABILITIES	100.000	100.000	100.000	100.000	100.000	100.000
ASSETS						
Gross Fixed Assets (Plant & Equipment)	76.000	76.000	76.000	76.000	76.000	76.000
Accumulated Depreciation	-22.800	-45.600	-68.400	-76.000	-76.000	-76.000
Net Fixed Assets	53.200	30.400	7.600	0	0	0
Bank & Cash	46.800	69.600	92.400	100.000	100.000	100.000
TOTAL ASSETS	100.000	100.000	100.000	100.000	100.000	100.000

Income Statement

	2018	2019	2020	2021	2022	2023
Taxable Revenues	167.375	334.125	360.855	703.667	886.621	
Not Taxable Revenues	5.000	0	0	0	0	
REVENUES	172.375	334.125	360.855	703.667	886.621	
Costs and Expenses	-140.028	-221.100	-228.228	-319.645	-368.432	
EBITDA	32.347	113.025	132.627	384.023	518.189	
Depreciations & Amortizations	-22.800	-22.800	-22.800	-7.600	0	
EBIT	9.547	90.225	109.827	376.423	518.189	
Interests	0	0	0	0	0	
EARNINGS BEFORE TAXES	9.547	90.225	109.827	376.423	518.189	
Taxes	-2.274	-45.113	-54.914	-188.211	-259.094	
NET EARNINGS	7.274	45.113	54.914	188.211	259.094	259.094

Cash Flow Statement

	2018	2019	2020	2021	2022	2023
CASH FLOWS FROM OPERATING ACTIVITIES						
Net Earnings	7.274	45.113	54.914	188.211	259.094	259.094
Depreciations & Amortizations	22.800	22.800	22.800	7.600	0	0
Net cash provided by operating activities	30.074	67.913	77.714	195.811	259.094	259.094
CASH FLOWS FROM INVESTING ACTIVITIES						
Investments (Plant & Equipment)	-76.000	0	0	0	0	0
Net cash provided by investing activities	-76.000	0	0	0	0	0
CASH FLOWS FROM FINANCING ACTIVITIES						
Capital contributions	100.000	0	0	0	0	0
Dividends	-7.274	-45.113	-54.914	-188.211	-259.094	-259.094
Bank Overdraft						
Mortgage						
Net cash provided by financing activities	92.727	-45.113	-54.914	-188.211	-259.094	-259.094
NET INCREASE IN CASH IN THE YEAR	46.800	22.800	22.800	7.600	0	0
CASH AT THE END OF THE YEAR	46.800	69.600	92.400	100.000	100.000	100.000

19. NET PRESENT VALUE AND INTERNAL RATE OF RETURN - WORKSHEET 2.2

Phidias can evaluate the new activity by reading the Net Present Value (NPV) and Internal Rate of Return (IRR), calculated assuming the Shareholders' perspective (worksheet 2.2 Financial Statements and Indicators), and a discount rate equal to 60%.

Discount Rate	%	60%
---------------	---	-----

These financial indicators are:

Shareholders' perspective		
Shareholders' Net Cash Flows: capital contributions, dividends, and terminal value		
NET PRESENT VALUE (NPV)	40.704	EUR
INTERNAL RATE OF RETURN (IRR)	85%	

iPlan also calculates the Return on Equity (ROE) and the Return on Investment (ROI) indices.

	2018	2019	2020	2021	2022	2023
RETURN ON EQUITY (ROE)	7%	45%	55%	188%	259%	259%
RETURN ON INVESTMENT (ROI)	7%	45%	55%	188%	259%	259%

20. NET PRESENT VALUE AND INTERNAL RATE OF RETURN - WORKSHEET 3.11

iPlan calculates the Net Present Value (NPV) and Internal Rate of Return (IRR) assuming the shareholders' perspective, and considering:

- The capital contributions, i.e. the initial capital and the other rounds of capital contribution,
- The net earnings in the business plan's time horizon (2018-2022) distributed as dividends,
- The dividends in the year (2023) in which the business operations will continue beyond the business plan's time horizon, and
- The selling price or liquidation value of the business activity at the end of 2023.

iPlan shows the approach applied in worksheet 3.11 NPV & IRR.

Shareholders' perspective							
	T=0	2018	2019	2020	2021	2022	2023
Business Plan's time horizon							
Capital Contributions	-20.000	-80.000					
Dividends		7.274	45.113	54.914	188.211	259.094	
Continuation of the business operations beyond the Business Plan's time horizon							
Dividends = Net Earnings							259.094
Selling price or liquidation value of the business activity at the end of 2023							
Terminal Value							105.000
Shareholders' net cash flows	-20.000	-72.727	45.113	54.914	188.211	259.094	364.094
t	0	1	2	3	4	5	6
Discount factor	1,00	0,63	0,39	0,24	0,15	0,10	0,06
Present Value	-20.000	-45.454	17.622	13.407	28.719	24.709	21.702
NET PRESENT VALUE (NPV)		40.704					
INTERNAL RATE OF RETURN (IRR)		85%					

Worksheet 3.11 NPV & IRR Monthly shows the same calculations of the NPV and IRR indices when monthly data are considered.

In a similar way, iPlan calculates the Net Present Value (NPV) and Internal Rate of Return (IRR) assuming the Company's perspective, as shown in worksheet 3.11 NPV & IRR.