30 Jan 2020
Sponsored research
Alternative Energy
France

Europlasma

Zigi turns shares into fine dust

Opinion	Call Option
Upside (%)	8,614
Price (€)	0.00
Target Price (€)	0.24
Bloomberg Code	ALEUP FP
Market Cap (€M)	1.40
Enterprise Value (€th)	171,246

Momentum	NEGATIVE
Governance	6.5/10
Credit Risk	B↗

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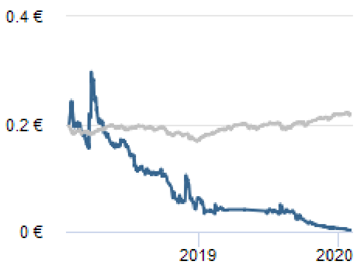


Conflicts of interest

Corporate broking	No
Trading in corporate shares	No
Analyst ownership	No
Advice to corporate	No
Research paid for by corporate	Yes
Corporate access	No
Brokerage activity at AlphaValue	No
Client of AlphaValue Research	No

PROS

- Europlasma is part of a handful of companies worldwide able to master plasma torches in fields that span emission control and green energy provision
- The use of plasma torches to better the performance of waste-to-power processes provides Europlasma with an ace when it comes to efficiency
- Europlasma has a unique market position in its capability to deal with abestos waste

CONS

- By investing to capture the value attached to plasma-based processes, Europlasma has stretched itself and stumbled on funding issues. Costly refinancing exercises have been a drain on management's time
- Europlasma may end up selling one of its businesses to fund the others

KEY DATA	12/16A	12/17A	12/18E	12/19E	12/20E
Adjusted P/E (x)	**-1.70**	**-1.31**	**-1.67**	**-4.99**	**0.52**
Dividend yield (%)	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
EV/EBITDA(R) (x)	-3.45	-5.03	-24.8	23.6	9.55
Adjusted EPS (€)	**-0.18**	**-0.16**	**-0.05**	**-0.01**	**0.01**
Growth in EPS (%)	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
Dividend (€)	0.00	0.00	0.00	0.00	0.00
Sales (€th)	9,733	13,133	14,000	24,560	45,160
Operating margin (%)	*-173*	*-107*	*-61.6*	*3.19*	*23.8*
Attributable net profit (€th)	-17,273	-21,820	-11,079	-3,742	3,417
ROE (after tax) (%)	**3,126**	**232**	**91.8**	**68.1**	**80.7**
Gearing (%)					*902*

Detailed financials at the end of this report

Key Ratios

		12/17A	12/18E	12/19E	12/20E
Adjusted P/E	x	-1.31	-1.67	-4.99	0.52
EV/EBITDA	x	-5.03	-24.8	23.6	9.55
P/Book	x	-2.11	-2.73	-12.3	0.17
Dividend yield	%	0.00	0.00	0.00	0.00
Free Cash Flow Yield	%	-37.8	-55.6	-237	-2,989
ROE (after tax)	%	232	91.8	68.1	80.7
ROCE	%	-113	-9.69	0.44	4.14
Net debt/EBITDA	x	-1.70	-9.52	11.8	6.10

Consolidated P&L

		12/17A	12/18E	12/19E	12/20E
Sales	€th	13,133	14,000	24,560	45,160
EBITDA	€th	-8,057	-3,700	6,832	17,936
Underlying operating profit	€th	-13,799	-8,625	782	10,761
Operating profit (EBIT)	€th	-14,096	-8,625	782	10,761
Net financial expenses	€th	-854	-2,500	-4,000	-5,500
Pre-tax profit before exceptional items	€th	-14,950	-11,125	-3,218	5,261
Corporate tax	€th	30.0	0.00	0.00	0.00
Attributable net profit	€th	-21,820	-11,079	-3,742	3,417
Adjusted attributable net profit	€th	-21,164	-11,079	-3,742	3,417

Cashflow Statement

		12/17A	12/18E	12/19E	12/20E
Total operating cash flows	€th	-8,169	-3,548	6,332	16,936
Capital expenditure	€th	-3,100	-7,500	-63,000	-65,000
Total investment flows	€th	-3,800	-8,500	-64,000	-66,000
Dividends (parent company)	€th				
New shareholders' equity	€th	14,200	6,000	6,000	16,000
Total financial flows	€th	12,300	700	40,000	65,500
Change in net debt position	€th	2,531	-21,548	-45,668	-28,564
Free cash flow (pre div.)	€th	-12,123	-13,548	-60,668	-53,564

Balance Sheet

		12/17A	12/18E	12/19E	12/20E
Goodwill	€th	8.00	1,000	1,000	1,000
Total intangible	€th	201	1,314	1,314	1,500
Tangible fixed assets	€th	13,341	51,000	111,000	165,000
WCR	€th	1,152	2,000	3,500	5,500
Total assets (net of short term liabilities)	€th	28,299	72,314	136,814	193,000
Ordinary shareholders' equity (group share)	€th	-15,224	-8,909	-2,077	10,546
Provisions for pensions	€th	573	0.00	0.00	0.00
Net debt / (cash)	€th	13,675	35,223	80,891	109,454
Total liabilities and shareholders' equity	€th	28,311	72,314	136,814	193,000

Per Share Data

		12/17A	12/18E	12/19E	12/20E
Adjusted EPS (bfr gwill amort. & dil.)	**€**	**-0.16**	**-0.05**	**-0.01**	**0.01**
Net dividend per share	**€**	**0.00**	**0.00**	**0.00**	**0.00**
Free cash flow per share	€	-0.09	-0.06	-0.13	-0.08
Book value per share	€	-0.10	-0.03	0.00	0.02
Number of diluted shares (average)	**Th**	**132,028**	**223,203**	**467,000**	**640,000**

Contents

Businesses & Trends

Founded in 1992 to market the plasma torch technology, Europlasma offers solutions to major environmental issues: toxic waste neutralization and renewable energy production. Both rely on the use of plasma's ultra-high temperatures to trigger changes to chemical structures. Plasma as a molecule breaker can be deployed in various industrial processes but testing periods are usually long before implementing a solution. Part of the Europlasma drive to go downstream (i.e. deploy plasma-based solutions and operate them) is owing to this observation. Since 2013, the company has narrowed its focus to three divisions:

1) The design and development of plasma torch systems which are usually sold with operational maintenance contracts. Rechristened "Europlasma Industries" in 2014, the division sells export licences (Japan, South Korea), and in 2017 delivered a fly-ash neutralization plant in China as well as a radioactive waste confinement plant in Bulgaria. As of 2018 the group has initiated technical discussions with ArcelorMittal to deploy plasma torches in steel furnaces aimed at reducing CO2 production.

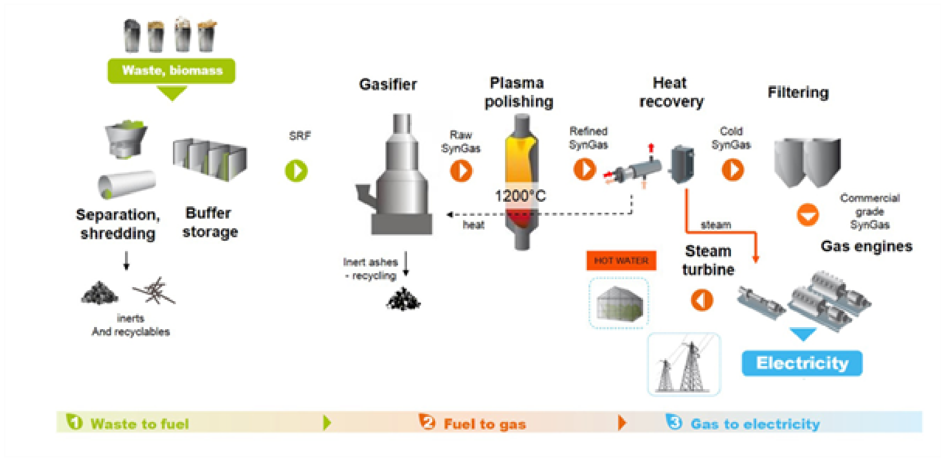
2) Renewable Energies through the design, construction and operation of high-efficiency power generation solutions from waste and biomass, through production sites which it operates and majority controls; and

3) Asbestos Waste (Inertam) is dedicated to neutralizing and upcycling asbestos waste. The division operates its own kilns for that purpose, powered by plasma torches. Another unrelated engineering business (Europe Environnement) was divested in 2013.

A painful and lengthy transition to green power

Europlasma's business model has been in transition since 2011 with a hard push into "green" power generation combining plasma torch and waste/biomass to produce a clean gas which is then converted into electricity (see picture). The heart of the Europlasma proposition is the gas cleaning phase that relies on plasma torches. Clean gas means efficient subsequent conversion into power through heavy duty internal combustion engines driving power generators. The thermal and electrical efficiency from waste to power is attractive to financial investors primarily because alternative power sources tend to be subsidised as low carbon emitter units (better conversion means less carbon). Europlasma has thus a competitive advantage due to a powerful technological barrier to entry: the plasma torch technology and related patents which improves the quality of the gas generated from waste/biomass. Green power offers considerable growth potential as waste to power schemes appear to be much in demand and heavily subsidised while technological progress brings down costs quickly. Green electricity has been the bold ambition of the group … with all the painful experiences attached to developing a frontier technology. By 2017 the group had fully sorted the teething issues but was about three years behind its initial schedule. The prototype technology on its Morcenx site has appeared to be delivering at nominal targets since late 2017.

From waste to energy: syngas cleaned by a plasma process



A management change in mid 2014 led to a complete overhaul of the growth plans which were pushed back while the typical technology challenges were being sorted. While the initial ambitions have been reigned in, there are 3 new power plants in the pipe line with the first called “CHO Tiper” nearly fully funded (more below)

One of the obvious difficulties was that funding this bold move on a shoestring was a recipe for disaster. This has had major funding implications with a massive recapitalisation (c.€50m) between 2013 and 2017 (see Debt section). In addition to skilfully navigating the technology and funding issues, the current management has also worked on amending an original organisational mistake whereby Europlasma ended up as a minority owner of the power units. In addition to a complex legal structure/web of contracts this led to a misalignment of interests with financial backers. The issue was eventually sorted in April 2018 by way of an asset swap meaning that Europlasma now controls its first power unit and intends to retain a controlling position in future additional units. Please see the Worth Knowing section for more on this.

More on the green power scheme:

The CHO Power/Renewable Energies prototype industrial facility built at Morcenx (near Bordeaux) produces clean biomass gas, thanks to the plasma torch. This gas is used in a gas-powered engine to deliver electricity to EDF, the French dominant utility obliged by law to buy green power, in addition to heat delivered to local wood-drying facilities. The nominal global thermal yield is excellent at 75%. Power is sold to EDF under a 20-year guaranteed-price contract. Pricing depends on the total electrical & thermal output obtained, knowing that each additional percentage point of output above 50% efficiency gives the right to a €1 increase per MWh relative to the base tariff of €125/MWh. Hence, for a total yield at 75% already at hand, the facility can sell its electricity for €150/MWh. Our models are based on a 11MW base unit.

Europlasma has ambitious plans to expand from the Bordeaux-based pilot project to other sites, with one ready (CHO CHO Tiper, say by September 2018 for the first brick laying) and another not far off (CHO Locminé) with the first steps possibly by 2019. Another three sites have been identified in France, although new French energy laws have changed the obligation to purchase green power to a new but less certain regulation whereby green energy is bought at a market price plus a top -up depending on the type of "green". Europlasma may end up benefiting as it believes that its technology is the only one that can truly convert waste, which is "sold" at a negative price whereas biomass has a true cost and is comparably scarce. Earlier similar plans in the UK, a large market for waste to power conversion, have been on the back-burner as the Europlasma engineering team and financial resources are clearly stretched.

The very nature of power generation means that these projects can be highly leveraged (unless the future power purchasing scheme proves too uncertain). Leverage matters as, financially speaking, Eurosplasma is not expect to fund c.€250-300m capex for 5 plants on its own. Indeed between 2011 and 2017 inclusive, Europlasma will have already invested c.€-100m in developing the technology and the first plant or about 5x its 2017 market cap. Now that the technology is up to speed, such cumulative investments can be regarded as the establishment of goodwill that the company will contribute to production JVs so as to retain control. Each JV can then be geared up in its own right, using leverage intelligently. (Please read "Funding section"). Assuming no major operating hiccups, the business model is about adding power plants, collecting a margin on the EPC, O&M and on power prices (consolidated accounts).

The potential market for waste to power is huge and only limited by available equity capital/proper returns/green energy prices/subsidies. Europlasma is not alone in fostering such projects but it is a fact that most initiatives have capitulated as there is quite a gap between a concept on a drawing board and coping with real life hurdles such as the variable energy content of waste. Europlasma sees itself as being pretty much alone in mastering the technology. There are obviously other ways to produce competitive green energy than to convert waste into gas then power but Europlasma's way happens to responsd to 2 issues: reducing the waste pile and meeting energy demand. Isolated territories such as islands see the benefits.

In 2018, Europlasma looks to have undergone a complete transformation as a company and is now in a position to generate its first power generation free cash flows.

Divisional Breakdown Of Revenues

	Sector	12/17A	12/18E	12/19E	12/20E	Change 18E/17		Change 19E/18E	
						€th	of % total	€th	of % total
Total sales		**13,133**	**14,000**	**24,560**	**45,160**	**867**	**100%**	**10,560**	**100%**
Engineering, Torch (Europlas...	Industry Specific Equipment	1,343	1,000	3,000	4,000	-343	-40%	2,000	19%
Renewable Energy (CHO-P...	Alternative Power Sources	4,356	4,000	10,560	28,160	-356	-41%	6,560	62%
Toxic Waste Neutralization (In...	Waste Mgt & Recycling	7,434	9,000	11,000	13,000	1,566	181%	2,000	19%
Air & Gaz (Europe Environne...	Gases & Liquid Process.	0.00	0.00	0.00	0.00	0	0%	0	0%
Other		0.00	0.00	0.00	0.00	0	0%	0	0%

Key Exposures

	Revenues	Costs	Equity
Dollar	15.0%	20.0%	45.0%
Emerging currencies	5.0%	0.0%	0.0%
Long-term global warming	90.0%	0.0%	0.0%

Sales By Geography

Europe	90.0%
Asia	10.0%

We address exposures (eg. how much of the turnover is exposed to the $) rather than sensitivities (say, how much a 5% move in the $ affects the bottom line). This is to make comparisons easier and provides useful tools when extracting relevant data.
Actually, the subject is rather complex on the ground. The default position is one of an investor managing in €. An investor in £ will obviously not react to a £ based stock trading partly in € as would a € based investor. In addition, certain circumstances can prove difficult to unravel such as for eg. a € based investor confronted to a Swiss company reporting in $ but with a quote in CHF... Sales exposure is probably straightforward but one has to be careful with deep cyclicals. Costs exposure is a bit less easy to determine (we do not allow for hedges as they can only be postponing the day of reckoning). How much of the equity is exposed to a given subject is rarely straightforward but can be quite telling
In addition, subjects are frequently intertwined. A $ exposure may encompass all revenues in $ pegged currencies and an emerging currency exposure is likely to include $ pegged currencies as well.
Exposure to global warming issues is frequently indirect and may require to stretch a bit imagination.

Money Making

Now readable energy business model

The April 2018 reorganisation (see Worth Knowing) has left Europlasma with a readable business model: it has a technology which is deployed in power plants it controls, it generates revenues from selling power and funds its capex, financing and operating costs from such revenues.

In effect, if its growth unfolds according to plan, Europlasma has become a power generation business. The earlier legal complexity wherein Europlasma was a junior partner in its power generation unit led to complex modelling and an overall “look” as an engineer and capex supplier play. What remains true though is that the firm is a confidence-building exercise with minority equity providers and lenders such that it can fund the capital intensive nature of its business (say €60m capex per power unit). The experience curve is an intangible asset that will help derive the best from power plants although every additional power unit will tie up this sort of capital spending.

As Europlasma adds units, its consolidated accounts will reflect heavy capital expenditures and financig costs and a near-50% of its power related earnings reverting to minorities. This will only tardily be paid out as dividends to minority equity holders in power plants. At the time of writing, the sequencing of such payments is down to guess work.

To meet the expansion schedule, one has to expect capital increases in the shape of minorities stepping up to the plate as well as capital increases from the parent company itself. These have been allowed for in the financial AlphaValue’s modelling from April 2018 onwards.

In terms of visible capex efforts, the priority is the CHO Tiper plant. It is probably a good indicator of things to come with debt funding of c.€44m (provided by national and regional agencies, and the EIB) and equity at c.€21m. The completion of the equity leg will determine the construction calendar. We have assumed that CHO Tiper is likely to be delivering kwh in early 2020. For CHO Tiper, all authorisations have been cleared including the long-term purchase of its output by EDF at attractive prices. The second project unit at Locminé has seen its application cleared by the local authorities and the contract for attractive power realisation prices has been signed. Nimbyers surfaced at the close of 2017 potentially delaying the project a bit. We have allowed for power production by September 2020. The three other projects (2 more in Western France, 1 in North East France) are on longer-term calendars, yet other short-term projects are actively being developed to feed the pipe-line.

Waste management is about capacity sequencing

In 2013, Europlasma simplified its legal set-up such that the other businesses are also simpler to read. This is the case for Inertam, now fully focused on the processing of asbestos waste. The potential returns are high due to the scarcity of treatment capacity and increasingly tough legislation aimed at destroying asbestos as opposed to burying it. This is potentially a money-spinner with EBITDA margins in the 25-30% region depending on maintenance /capacity usage. Like in any melting process, kilns have to be frequently relined. Note that the by-product of asbestos burning is a glass-like material that has heat retention features which makes it attractive for heating systems.

2016 and 2017 were meant to be recovery years with a good utilisation rate and firm prices up to the moment the one kiln plant had to be stopped on safety concerns for staff potentially exposed to asbestos leaks and then by maintenance (refurbishing of the refractory lining). The plant is now back at nominal capacity and. by late 2018, the group hopes to implement the construction of a spare furnace meaning that maintenance will be less of an issue. This is, however, unlikely to double capacity as the complex industrial installations would also need to be expanded although it will help processing capacity over a given year. Additionally, now that the asbestos treatment process is reliable, Inertam can think about developing new projects, at least across France, mirroring the CHO Power business model.

Torches reinvented as service?
Whereas Inertam provides a service, Europlasma's parent company, by contrast, is an engineer exploring the many uses of the plasma torch. This is a complex field with few competitors providing industrial usage equipment. Interesting co-developments, such as with Kobe Steel concerning fluidified combustion beds, are promising but are long lead-time projects. This part of the business is in effect a form of R&D on request. Management is keen to turn this into immediate revenues through consultancy/engineering work in all industries concerned with ultra-high temperatures and the successful deliveries in 2017 of a fly-ash plant in China and of a low radioactive treatment plant in Bulgaria are clear evidence that the group's industrialization efforts in the last few years are paying off. The business model of the ongoing work with ArcelorMittal to use plasma to contain CO2 emissions and convert CO2 into energy has not been made public.

All in all, the earnings pattern has been one of kitchen-sinking-type, enormous one-offs from 2013 to 2017. The firm would have gone under without a continuing stream of highly dilutive recaps from 2014 to 2017 (equity lines + convertible). Earnings visibility remains low as might be expected of such a high risk/high return proposition but the worst of the risks now seem to be behind us. Earnings are bound to partly recover from 2018 with Inertam back on track and with power production already generating steady revenues (c.€10m as a rough guess).

To summarise the business model, Europlasma the engineer of yore is fast becoming a green power generation company and a provider of plasma-torch-based services (asbestos treatment and possibly CO2 treatment in steel plants). Remember that all these businesses are capital intensive, with long lead times.

Divisional Operating results

	12/17A	12/18E	12/19E	12/20E	Change 18E/17		Change 19E/18E	
					€th	of % total	€th	of % total
Total	**-14,097**	**-8,625**	**782**	**10,761**	**5,472**	**100%**	**9,407**	**100%**
Holding, R&D, Engineering, Torch (Europlasma)	-3,496	-4,200	-3,600	-3,300	-704	-13%	600	6%
Renewable Energy (CHO-POWER)	-6,324	-3,125	3,932	13,111	3,199	58%	7,057	75%
Toxic Waste Neutralization (Inertam)	-4,277	-1,300	450	950	2,977	54%	1,750	19%
Air & Gaz (Europe Environnement)	0.00	0.00	0.00	0.00	0	0%	0	0%
Other/cancellations	0.00	0.00	0.00	0.00	0	0%	0	0%

Divisional Operating results margin

	12/17A	12/18E	12/19E	12/20E
Total	**-107%**	**-61.6%**	**3.19%**	**23.8%**
Renewable Energy (CHO-POWER)	-145%	-78.1%	37.2%	46.6%
Toxic Waste Neutralization (Inertam)	-57.5%	-14.4%	4.09%	7.31%
Air & Gaz (Europe Environnement)				

Valuation

The valuation of Europlasma, notwithstanding its considerable financing question marks which are now seemingly contained, is driven by its shift in status from a capital goods supplier to that of a green energy play. The business principle seems to be that a promising technology needs to be made to work in complex environments in which Europlasma is better positioned to extract a result. This was true for asbestos treatment and even truer for green energy generation, and may also be so when exhaust gases from high furnaces are potentially converted into energy.

The reorganisation instating majority control of energy production assets is obviously most welcome as it matches the above. The convoluted valuation exercise of valuing capex + operations of said capex is no longer required. A reminder of what these businesses entail from a valuation stand point:

Europlasma's torch manufacturing business can be regarded as a capital goods supplier.

The Inertam (toxic waste neutralization) valuation is also rather straightforward in that it has set up treatment capacity and is being paid to process waste. As this is a scarce resource, Inertam's processing margins are strong because prices stick. This amounts to valuing a waste processor with firm prices and regulation-dependent growth prospects.

CHO Power is now a simpler proposition as a green power generation unit endowed with a valuable proprietary technology and the value attached to the deployment of new power plants.

DCF

The DCF-based valuation has become simpler overnight as the assets are now controlled and fully consolidated. The tricky part is to allow for the proper value of what reverts to minorities. Not easy. We have also made some brave assumptions about out-year capex (set to decline) and taxes as we allow for tax loss carry forwards that should be used rapidly now that production profits accrue to the group.

NAV

NAV calculations have also become easier now that Europlasma owns and controls its businesses. It is worth mentioning that applying the transaction multiple (19x EBITDA) recorded by the Canadian group AlterNRG would value the O&M activities alone at c.€70m. However, CHO Power is more advanced than AlterNRG, which has no commercial scale plant in operation. Above all, Europlasma is now a fully integrated business that designs and manages power stations as well as market the power. The asset swap that took place in April 2018 values CHO Power at €101m which may prove conservative when the next power plant is fired.

This valuation of AlterNRG is due to a successful bid (June 2015) from Chinese privately-held Kaidi. It did confirm that there is a paucity of assets in the waste gasification field … and that Chinese engineering groups are structural buyers of know-how in the field as their domestic market has such requirements. This potentially constitutes a significant source of upside for Europlasma shareholders.

Peer metrics

We use a combination of various peers currently tracked by AlphaValue. On the engineering side we use both GEA and Elecnor which has a strong presence in renewable energies/environment (bio-energy, solar energy), primarily in terms of engineering. Europlasma green power generation will be matched by Acciona (solar and wind power), ERG (wind power) and Drax (biomass) plus smaller listed operations (ebioss and La Française de l'Energie)..

Valuation Summary

Benchmarks		Values (€)	Upside	Weight
DCF		0.48	17,101%	35%
NAV/SOTP per share		0.07	2,451%	20%
EV/EBITDA based		n/a	0%	20%
P/E	*Peers*	0.00	-50%	10%
Dividend Yield	*Peers*	0.00	-100%	10%
P/book based		n/a	0%	5%
Target Price		**0.24**	**6,461%**	

Comparison based valuation

Computed on 18 month forecasts	P/E (x)	Ev/Ebitda (x)	P/Book (x)	Yield(%)
Peers ratios	20.3	8.52	1.38	2.98
Europlasma's ratios	n/a	n/a	n/a	n/a
Premium	50.0%	50.0%	0.00%	0.00%
Default comparison based valuation (€)	**0.00**	**n/a**	**n/a**	**0.00**
Acciona	18.6	7.98	1.54	1.97
GEA Group	28.5	14.2	2.10	2.83
ERG	26.2	9.10	1.47	3.51
Drax Group	11.9	4.43	0.48	6.47
Elecnor	10.8	7.02	1.39	3.23
Ebioss Energy	n/a	n/a	n/a	n/a

DCF Valuation Per Share

WACC	%	6.66
PV of cashflow FY1-FY11	€th	-109,2...
FY11CF	€th	43,203
Normalised long-term growth"g"	%	2.00
ESG weighted "g"	%	2.19
Terminal value	€th	967,272
PV terminal value	€th	507,590
PV terminal value in % of total value	*%*	*127*
Total PV	€th	398,299

Avg net debt (cash) at book value	€th	58,057
Provisions	€th	12,000
Unrecognised actuarial losses (gains)	€th	0.00
Financial assets at market price	€th	0.00
Minorities interests (fair value)	€th	20,000 [1]
Equity value	€th	308,242
Number of shares	Th	640,000
Implied equity value per share	€	0.48

1. DCFs are highly sensitive to the market value of the stakes held by minority partners in power plants. See also enterprise value breakdown for a longer term perspective

Assessing The Cost Of Capital

Synthetic default risk free rate	%	3.50
Target equity risk premium	%	5.00
Tax advantage of debt finance (normalised)	%	30.0
Average debt maturity	Year	5
Sector asset beta	x	0.90 [2] [3]
Debt beta	x	1.00
Market capitalisation	€th	1,792
Net debt (cash) at book value	€th	35,223
Net debt (cash) at market value	€th	29,864

Company debt spread	bp	500
Marginal Company cost of debt	%	8.50
Company beta (leveraged)	**x**	**3.00**
Company gearing at market value	%	1,966
Company market gearing	%	95.2
Required return on geared equity	**%**	**18.5**
Cost of debt	%	5.95
Cost of ungeared equity	**%**	**8.00**
WACC	%	6.66

2. Alternative energy sector beta
3. While we regard Europlasma as an Alternative Energy utility, the default beta of 0.58 for utility assets was too low; we now use 0.9 to allow for the utility side (Inertam)

DCF Calculation

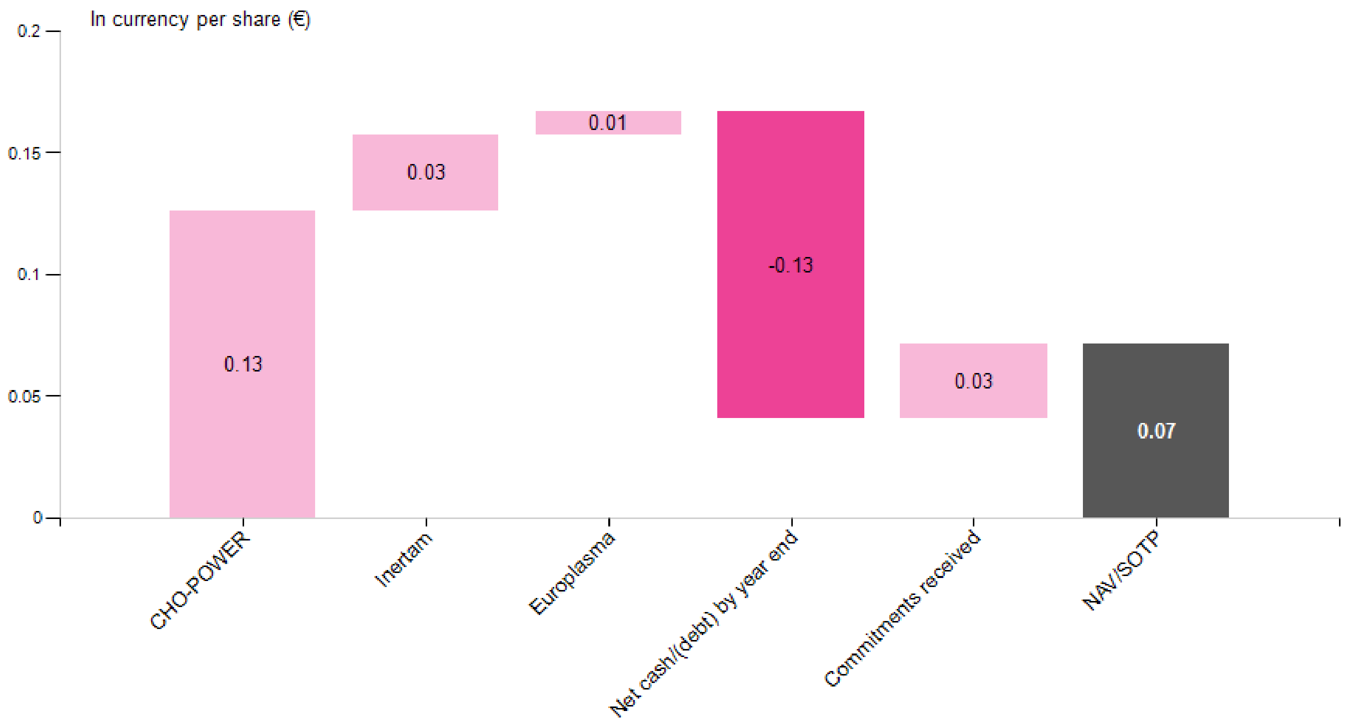
		12/17A	12/18E	12/19E	12/20E	Growth	12/21E	12/28E
Sales	€th	13,133	14,000	24,560	45,160	**15.0%**	51,934	138,145
EBITDA	€th	-8,057	-3,700	6,832	17,936	**18.0%**	21,165	67,420
EBITDA Margin	*%*	*-61.3*	*-26.4*	*27.8*	*39.7*		*40.8*	*48.8*
Change in WCR	€th	1,667	-848	-1,500	-2,000	**8.00%**	-2,160	-3,702
Total operating cash flows (pre tax)	€th	-8,199	-3,548	6,332	16,936		19,005	63,718
Corporate tax	€th	30.0	0.00	0.00	0.00	**0.00%**	0.00	0.00
Net tax shield	**€th**	**-256**	**-750**	**-1,200**	**-1,650**	**0.00%**	**-1,650**	**-1,650**
Capital expenditure	€th	-3,100	-7,500	-63,000	-65,000	**-15.0%**	-55,250	-17,712
Capex/Sales	*%*	*-23.6*	*-53.6*	*-257*	*-144*		*-106*	*-12.8*
Pre financing costs FCF (for DCF purposes)	€th	-11,525	-11,798	-57,868	-49,714		-37,895	44,356
Various add backs (incl. R&D, etc.) for DCF purposes	€th							-2,000 [4]
Free cash flow adjusted	**€th**	**-11,525**	**-11,798**	**-57,868**	**-49,714**		**-37,895**	**42,356**
Discounted free cash flows	**€th**	**-11,525**	**-11,798**	**-54,254**	**-43,699**		**-31,230**	**22,227**
Invested capital	€	14.7	62.3	126	182		155	43.9

4. Dividends paid to minorities

NAV/SOTP Calculation

	% owned	Valuation technique	Multiple used	Valuation at 100% (€th)	Stake valuation (€th)	In currency per share (€)	% of gross assets
CHO-POWER	80.0%	Adj. historical price		101,000	80,800 (1)	0.13	75.7%
Inertam	100%	EV/EBIT	20	20,000	20,000 (2)	0.03	18.7%
Europlasma	100%	EV/EBIT	12	6,000	6,000 (3)	0.01	5.62%
Other					0.00	0.00	0.00%
Total gross assets					**106,800**	**0.17**	**100%**
Net cash/(debt) by year end					-80,891	-0.13	-75.7%
Commitments to pay							
Commitments received					19,800 (4)	0.03	18.5%
NAV/SOTP					45,709	0.07	42.8%
Number of shares net of treasury shares - year end (Th)					**640,000**		
NAV/SOTP per share (€)					**0.07**		
Current discount to NAV/SOTP (%)					**96.1**		

1. Based on the March 2018 transaction with Gottex which puts an equity value on CHO Power
2. Environmental services multiple
3. The EV/EBIT multiple is 20% below the 2018 weighted average for the capital goods sector
4. NPV of tax credits. We indeed assume that all power generation projects are profitable



Debt

Europlasma, as it battles with its technology and timetable, has been a perennial fund raiser from 2014 to 2018 inclusive. This is expected to be less painful as the group hopes to rely on debt financing for c.2/3rds of new power units and a substantial proportion of minority-held equity funding. In a perfect world where all interests are aligned owing to the good performance of power plants, Europlasma's share of any future plants should be in the region of €10m. It is unlikely to be funded by cash flows before the next 3 to 5 years.

Recent expensive funding

Since 2015, Europlasma has had to resort to expensive equity funding whereby its immediate needs were met by the issue of "on stream" equity at the market price. Indeed takers of new shares have tended to sell them immediately. In H1-2018, the group launched a €8m financing with such a profile with the European High Growth Opportunity Fund as a taker. The previous round of funding to the tune of €15m provided by Bracknor Capital proved remarkably expensive in terms of dilution but that was the price to pay to get the pilot project to the point where it would stop burning cash. Please revert to the company website for a thorough description of successive financing layers.

Previously-issued warrants (see terms on the company website) are essentially out of the money owing to this massive dilution. To offset this frustrating outcome, as of late October 2017, Europlasma offered the shareholders free warrants with a first strike price at €0.32 before 30/06/2018 which looked unlikely to be reached at time of writing and another strike price at €0.75 with more oxygen, calendar wise (31/12/2021).
It is worth mentioning that the c.€5m convertible issued in late 2015 with an end-2018 redemption will not be converted (strike at €1.06 + capitalised interest) meaning that we have allowed for c.40m new shares in our share number forecasts.

Better funding news

Better financing news stemmed from the sponsoring by the French Agency for greener power (ADEME) of a €12m funding line at 0.99% tied to the CHO Tiper development. The European Investment Bank then backed the project with €30m of debt funding. CHO Tiper is the first project after the prototype phase that Morcenx represents. The last step is to find the minority equity partners such that Europlasma retains the control.
In April 2018, Europlasma managed a successful asset swap with its funding partner in the first power plant (see Worth Knowing) with, to boot. a very respectable valuation (€101m) of the sub-holding company (CHOPower) that will manage its green energy prospects. Using this leverage, Europlasma can hope to rely on finding c.€50m of fresh equity at CHOPower level without losing control (currently at 80%)

Recent financing history:

On 1 December 2010, Europlasma signed a shareholder pact with a major private equity player specialised in renewable energy. This pact grants an extended first say on projects similar to that of the pilot, known as CHO Morcenx. The principle is

that Europlasma is funding 10% of the cost of energy sites (about €5m per project currently, starting from €4m then) and gets 25% of the equity/profit sharing. This figure rises to 35% once operational performance exceeds certain levels. Europlasma successfully launched two capital increases, raising a total of €6.3m on 12 July 2010 to finance part of its share of the construction of the first power facility. The company contracted a €6.2m bank loan (of which €1.2m pledged) over 12 years and at a fixed interest rate (4.4%) to finance the civil engineering works and related building materials for the pilot project at Morcenx.
By 2012, the massive losses recorded in that year led debt to shoot up to €20m from c.€4m. The equity base contracted to €14m from €35m so that the close of 2012 was a painful one in balance sheet terms. 2013 net debt reflected the absence of additional projects but also the deconsolidation of Europe Environnement which had c.€7m net debt, mostly made up of financial leases.
The short-term financing, provided most notably by Credit Suisse Europlasma LLP for c.€5m, rapidly proved to be too expensive a bridge, resulting in an urgent need to inject fresh equity. The initial c.€4.4m raised in early 2014 was supplemented by a c.€35.9m increase in November 2014 (including debt conversion) with more to come in the shape of two tranches of warrants if and when they are exercised (€23m and then €18.8m). Such warrants have not been exercised in that the equity refinancings that followed mean that the initial strike prices were too high

By late 2015, Europlasma had lined up €15m of extra equity-type financing, of which €5m by means of a convertible of which the coupon is redeemable in shares and €10m by way of an equity line. The equity line was stopped by summer 2016 after the issuance of c.€1.2m as the Bracknor funding was then better suited to market conditions at the time.

In all, the completion of the Bracknor funding and the full dilution stemming from previously-issued conditional instruments led to 60% dilution for the existing shareholders by the close of 2017. The €8m issued in 2018 come on top.

Detailed financials at the end of this report

Funding - Liquidity

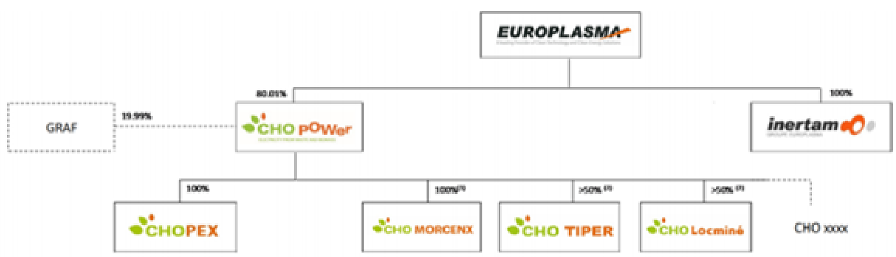
		12/17A	12/18E	12/19E	12/20E
EBITDA	€th	-8,057 [5]	-3,700	6,832	17,936
Funds from operations (FFO)	€th	-9,536	-5,200	3,832	13,436
Ordinary shareholders' equity	**€th**	**-15,224**	**-8,909**	**-2,077**	**10,546**
Gross debt	€th	21,800	32,000	60,000	105,000
+ Gross Cash	€th	8,125	-3,223	-20,891	-4,454
= Net debt / (cash)	**€th**	**13,675**	**35,223**	**80,891**	**109,454**
Gearing (at book value)	%				902
Adj. Net debt/EBITDA(R)	*x*	*-1.70*	*-9.52*	*11.8*	*6.10*
Adjusted Gross Debt/EBITDA(R)	*x*	*-3.79*	*-11.9*	*11.0*	*6.97*
Adj. gross debt/(Adj. gross debt+Equity)	*%*	*199*	*125*	*103*	*92.2*
Ebit cover	*x*	*-16.2*	*-3.45*	*0.20*	*1.96*
FFO/Gross Debt	*%*	*-31.2*	*-11.8*	*5.11*	*10.7*
FFO/Net debt	*%*	*-69.7*	*-14.8*	*4.74*	*12.3*
FCF/Adj. gross debt (%)	*%*	*-39.7*	*-30.8*	*-80.9*	*-42.9*
(Gross cash+ "cash" FCF+undrawn)/ST debt	*x*	*-1.33*	*-3.35*		
"Cash" FCF/ST debt	*x*	*-3.66*	*-2.71*		

5. Adjusted figure as the reported Ebitda (€-14m) is useless as it takes on board equity accounted earnings

Worth Knowing

The 2012 start-up of the CHO Morcenx pilot facility authenticated its mastery of the plasma torch-based technology used to clean gas derived from waste gasifying to be burned in combustion engines attached to generators. In 2013, the energy delivery stalled on account of a faulty bought-off-the-shelf gasifier. When the issue was sorted in 2014, it then appeared that the engines had to be beefed up. The learning curve has proved tremendously expensive but was completed by mid 2017.

From April 2018, Europlasma rejigged the control of its energy assets thereby providing a clearer view of its ambition and extracting some of the hidden value in its considerable development efforts. The asset reoganisation has proven complex in terms of the steps required. The final set up is as described in the following flowchart (supplied by the company). In effect, the main shareholder (with 65%) of the first green power generation SPV (called CHO Morcenx) is recapitalising the SPV and then swapping its existing 65% stake (and a €20m debt reduction in favour of CHO Power) in the said unit for a 20% stake in CHO Power. CHO Power, thus 80% owned by Europlasma, thereby raises its stake in CHO Morcenx from 35% to 100%. In the process, Europlasma's Renewable Energy division, CHO Power, is valued at €101m (80% owned by Europlasma) and will use that valuation for future capital increases and collect the full profits of the green power generation assets (SPVs such as CHO Morcenx). Eventually, this means that Europlasma plans to fund and take a controlling stake in every future SPV associated with green power generation.



Note that one of the nagging issues with Europlasma moving away from being a pure plasma torch designer to a green power generator based on the use of plasma systems was and is the capital intensity of green power generation. To contend with this issue, Europlasma was in effect (and prior to the April 2018 change) addressing this attractive new market under four different hats: a component provider, an EPC provider, a risk taker as a minority shareholder in ad hoc power generation SPVs and a power generation manager through a fully-owned subsidiary (CHOpex). The inconsistent bit, out of necessity, was to be a minority shareholder in the SPVs. This has been addressed with the financial restructuring. It does change the business profile as it becomes all of a sudden "consistent". Being the full owners of green energy SPVs means that Europlasma will book the energy revenues and become a power generator as well as an engineer for plasma solutions.

The complex business model prevailing until this reorganisation meant that Europlasma would record revenues as an equipment provider, EPC supplier and power plant operator but only receive dividends from its minority stake in the power plant. This also meant that economic interests were not aligned between capital providers.

The solution whereby the owner of the first SPV (CHO Morcenx) swapped a controlling stake against a minority stake in a bigger, more ambitious company that will control CHO Morcenx and the future SPVs has the immediate consequence of putting a price on CHO Power at €101m, of which Europlasma retains 80%. This is about 2.5x our previous valuation (although CHO Power then only had a 35% stake in Morcenx). It also puts a price on Morcenx at c. €30m or possibly twice its initial equity value.

Endless green uncertainties

Europlasma clearly evolves in the "green energy" business. In Europe, the steps to support "green energies" by way of subsidies and/or feed-in tariffs have been hesitant and impacted by budget constraints just about everywhere. Although governments should know the importance of a stable framework for alternative energy projects, it is clear that the French government lowered visibility in mid 2016 when it changed the rules for support mechanisms that are now slowly introduced as top-ups to market prices.

The French government had selected the gasification technology by name and identified Europlasma as a reference player in France for the Key Technologies 2015 research on the most promising technologies and those likely to create the most value and jobs. The strong support of the French agency for better use of energy (Ademe) to Europlasma attests to this.

Shareholders

Name	% owned	Of which % voting rights	Of which % free to float
Gottex	2.10%	4.10%	2.10%
Staff Europlasma	2.00%	2.30%	0.00%
Apparent free float			**98.0%**

Governance & Management

Europlasma's ambitious but underfunded inroads into green power are now back on track largely thanks to a new CEO appointed in late 2014. Subsequent changes to the Board presumably helped take unpleasant funding decisions through expensive equity and prepare the ground for the reorganisation of power plant control.

Governance score

Company (Sector)	Independent board
6.5 (6.0)	No

Parameters	Company	Sector	Score	Weight
Number of board members	6	13	9/10	5.0%
Board feminization (%)	0	31	1/10	5.0%
Board domestic density (%)	66	68	6/10	5.0%
Average age of board's members	71	59	1/10	5.0%
Type of company : Small cap, not controlled			10/10	25.0%
Independent directors rate (%)	33	49	3/10	20.0%
One share, one vote			✘	5.0%
Chairman vs. Executive split			✔	5.0%
Chairman not ex executive			✔	5.0%
Full disclosure on mgt pay			✔	5.0%
Disclosure of performance anchor for bonus trigger			✘	5.0%
Compensation committee reporting to board of directors			✔	5.0%
Straightforward, clean by-laws			✔	5.0%
Governance score			**6.5/10**	**100.0%**

Management

Name		Function	Birth date	Date in	Date out	Compensation, in k€ (year) Cash	Equity linked
Jean-Eric PETIT	M	CEO		2014		322 (2017)	216 (2017)
François MARCHAL	M	Deputy CEO		2013		(2017)	(2017)
Pierre CATLIN	M	Chairman	1949	2010		(2017)	84.0 (2017)
Krimer STEPHAN	M	CFO	1960	2017			

Board of Directors

Name		Indep.	Function	Completion of current mandate	Birth date	Date in	Date out	Fees / indemnity, in k€ (year)	Value of holding, in k€ (year)
Pierre CATLIN	M	✘	President/Chairman of th...	2016	1949	2010		84.0 (2017)	
Yann LE DORÉ	M	✔	Member			2016		20.0 (2017)	
Kim Ying LEE	M	✘	Member	2018		2008		20.0 (2017)	
Erik MARTEL	M	✔	Member	2022		2016		155 (2017)	
MASDAR VENTURE CAPITAL		✘	Member					0.00 (2017)	
Jean-Eric PETIT	M	✘	Member			2014		0.00 (2017)	

Social

Company (Sector)

5.9 (6.2)

Quantitative metrics (67%)

Set of staff related numerical metrics available in AlphaValue proprietary modelling aimed at ranking on social/HR matters

Parameters	Score	Weight
Staffing Trend	8/10	15%
Average wage trend	7/10	30%
Share of added value taken up by staff cost	1/10	20%
Share of added value taken up by taxes	1/10	15%
Wage dispersion trend	9/10	20%
Pension bonus (0 or 1)	0	
Quantitative score	**5.5/10**	**100%**

Qualitative metrics (33%)

Set of listed qualitative criterias and for the analyst to tick

Parameters	Score	Weight
Accidents at work	10/10	25%
Human resources development	8/10	35%
Pay	3/10	20%
Job satisfaction	10/10	10%
Internal communication	0/10	10%
Qualitative score	**6.9/10**	**100%**

AlphaValue analysts tick boxes on essential components of the social/HR corporate life.
Decision about ticking Yes or No is very much an assessment that combines the corporate's communication on relevant issue and the analyst's better judgment from experience.

Qualitative score

Parameters	Yes ✔ / No ✘	Weight
Accidents at work		**25%**
Set targets for work safety on all group sites?	✔	10.0%
Are accidents at work declining?	✔	15.0%
Human resources development		**35%**
Are competences required to meet medium term targets identified?	✔	3.5%
Is there a medium term (2 to 5 years) recruitment plan?	✘	3.5%
Is there a training strategy tuned to the company objectives?	✔	3.5%
Are employees trained for tomorrow's objectives?	✔	3.5%
Can all employees have access to training?	✔	3.5%
Has the corporate avoided large restructuring lay-offs over the last year to date?	✔	3.5%
Have key competences stayed?	✔	3.5%
Are managers given managerial objectives?	✔	3.5%
If yes, are managerial results a deciding factor when assessing compensation level?	✔	3.5%
Is mobility encouraged between operating units of the group?	✘	3.5%
Pay		**20%**
Is there a compensation committee?	✔	6.0%
Is employees' performance combining group AND individual performance?	✘	14.0%
Job satisfaction		**10%**
Is there a measure of job satisfaction?	✔	3.3%
Can anyone participate ?	✔	3.4%
Are there action plans to prop up employees' morale?	✔	3.3%
Internal communication		**10%**
Are strategy and objectives made available to every employee?	✘	10.0%
Qualitative score	**6.9/10**	**100.0%**

Staff & Pension matters

Europlasma is a small company in terms of headcount. Actual engineering work is delivered by partners.

Detailed financials at the end of this report

Summary Of Pension Risks

		12/17A	12/18E	12/19E	12/20E
Pension ratio	**%**	**0.00**	**0.00**	**0.00**	**0.00**
Ordinary shareholders' equity	€th	-15,224	-8,909	-2,077	10,546
Total benefits provisions	**€th**	**0.00**	**0.00**	**0.00**	**0.00**
of which funded pensions	*€th*	*0.00*	*0.00*	*0.00*	*0.00*
of which unfunded pensions	*€th*	*0.00*	*0.00*	*0.00*	*0.00*
of which benefits / health care	*€th*		*0.00*	*0.00*	*0.00*
Unrecognised actuarial (gains)/losses	€th	0.00	0.00	0.00	0.00

Geographic Breakdown Of Pension Liabilities

		12/17A	12/18E	12/19E	12/20E
US exposure	%				
UK exposure	%				
Euro exposure	%	100	100	100	100
Nordic countries	%				
Switzerland	%				
Other	%				
Total	%	100	100	100	100

Recent updates

28/11/2019

End of coverage

Significant news

Europlasma is going through a complete revamp of its management, its strategy and its finances. We stop coverage after seven years of paid-for research.

Fact

- Europlasma's new owners and managers published its 2018 accounts in October with a €-53m loss after a €32m amortisation of various assets. 2018 shareholders' funds stand at €-34m. Net debt stands at €28m.

- The management team is deemed to be completely renewed by November 2019,

- The AGM on the 2018 accounts and strategic review is to be held on 29//11/2019.

Analysis

In our previous update, we commented on the phenomenal dilution to be expected from the "equity line" type funding designed to make Europlasma survive as a going concern.

The last count on the number of shares is c. 550m. We had allowed for a rough 640m by the close of this year. Historical shareholders have thus been reduced to fine dust, as expected.

The new strategy is definitely centred on Europlasma's competences in the treatment of hazardous waste and the market opportunities offered by lower carbon intensity requirements.

Impact

We end coverage of Europlasma with this release.

05/08/2019

Restart

Financing issue

On 1 August, the French commercial court formally agreed on the refinancing plans to help Europlasma continue as is, albeit with new governance and massive dilution. We merely allow for that dilution from now on.

Fact

An ad-hoc Luxemburg based SPV named Zigi Capital and 50/50 owned by MM Alexandre-Henri Carré and Jérôme Garnache-Creuillot has committed to injecting the necessary resources into Europlasma to make it a successful venture. Those plans have been accepted by the commercial court. While there is an entirely new governance, the technique used to prop up the funding of Europlasma is massively dilutive as it amounts to de facto_ equity lines.

Analysis

Note that the previous governance had reached the conclusion that equity lines were no longer suitable as the group needed a substantial pocket of long-term funding for its two businesses and particularly for the capital intensive green power activity (CHO Power). If no long-term financing could be found for both, the idea was then to sell one of the businesses.

Zigi adds new layers of equity lines essentially achieved by the issuance of very short-term convertibles immediately converted into equity and sold in the market. Europlasma provided a detailed review of the potential number of shares once all known future layers of financing and payment of commissions to arrangers have been deployed.

As of end June 2019, the number of shares was 285m. We had anticipated 2019 to close at 345m shares prior to the financial restructuring and change of ownership. We now allow for 640m shares for 2019-2020-2021 as our current best guess of nearly-certain dilution

Note that Europlasma filed for Chapter 11 in January 2019 and has yet to publish its 2018 accounts. This means that the dilution is both phenomenal and based on highly theoretical earnings.

Impact

The impact on earnings last reviewed in November 2018 (...) is quite mechanical even though it is hardly visible with expected eps ranging from -0.01€ to 0.01€. The target price is divided by three as we have also taken a more cautious view on the DCF.

05/08/2019

Price to pay for survival: massive dilution

Change in Target Price — € 0.08 vs 0.23 — -67.6%

Now that the commercial court has signed off the restructuring and refinancing plans implemented by a new reference shareholder, we use the potential new number of shares of 640m shares vs. the 345m in our previous guesstimates. Note that, since 2018 accounts have yet to be released, the modelling is out of whack anyway. Everything hinges on the ability of the new governance to obtain full funding for the green power projects, delivered on time. The financial restructuring will have taken its toll on that front.

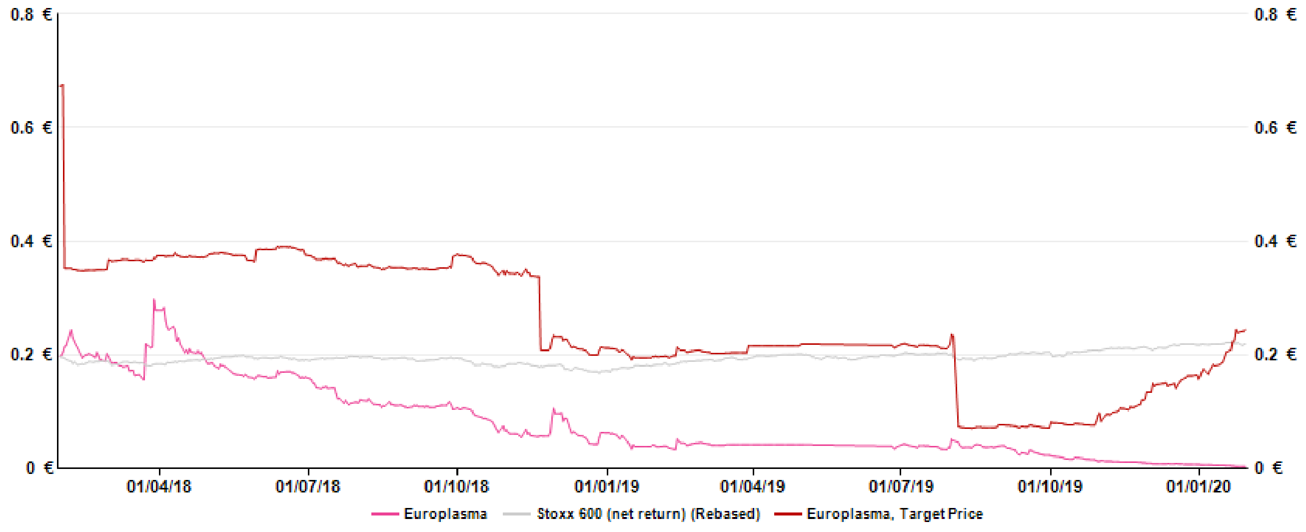
Change in NAV — € 0.07 vs 0.23 — -69.2%

We have allowed for the potential increase in the number of shares and use the 2020 net debt instead while the gross asset valuation is unchanged.

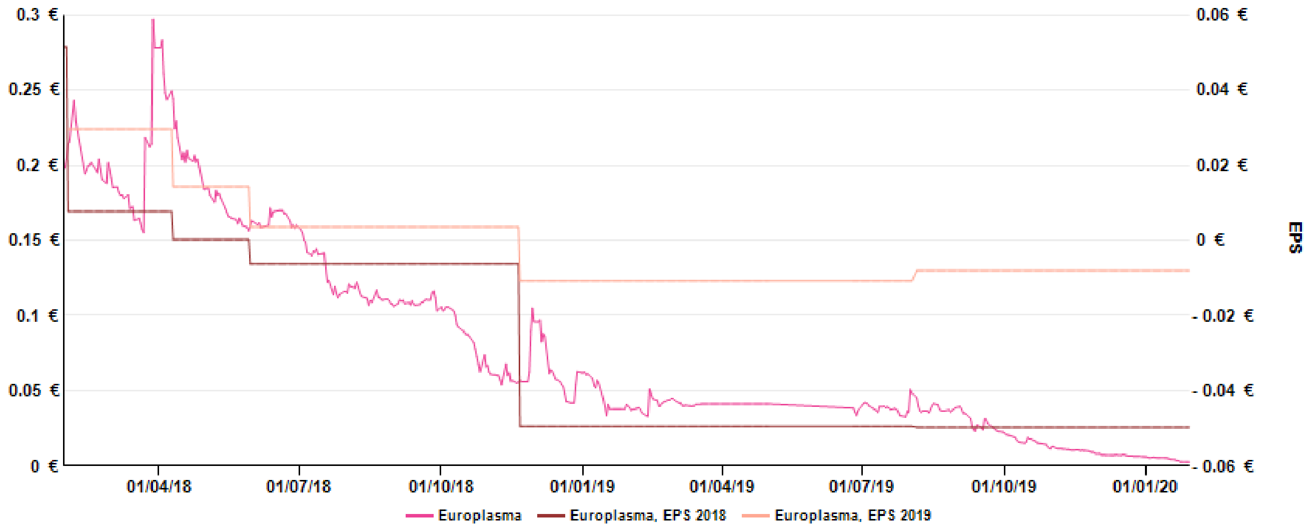
Change in DCF € 0.15 vs 0.51 -70.4%

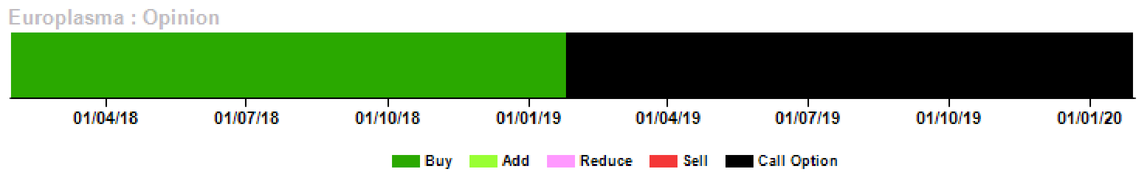
We have allowed for the potential increase in the number of shares and changed the sector beta from 0.58 (utilities) - which is way too low as long as the business model has yet to stabilise - to 0.9.

Stock Price and Target Price

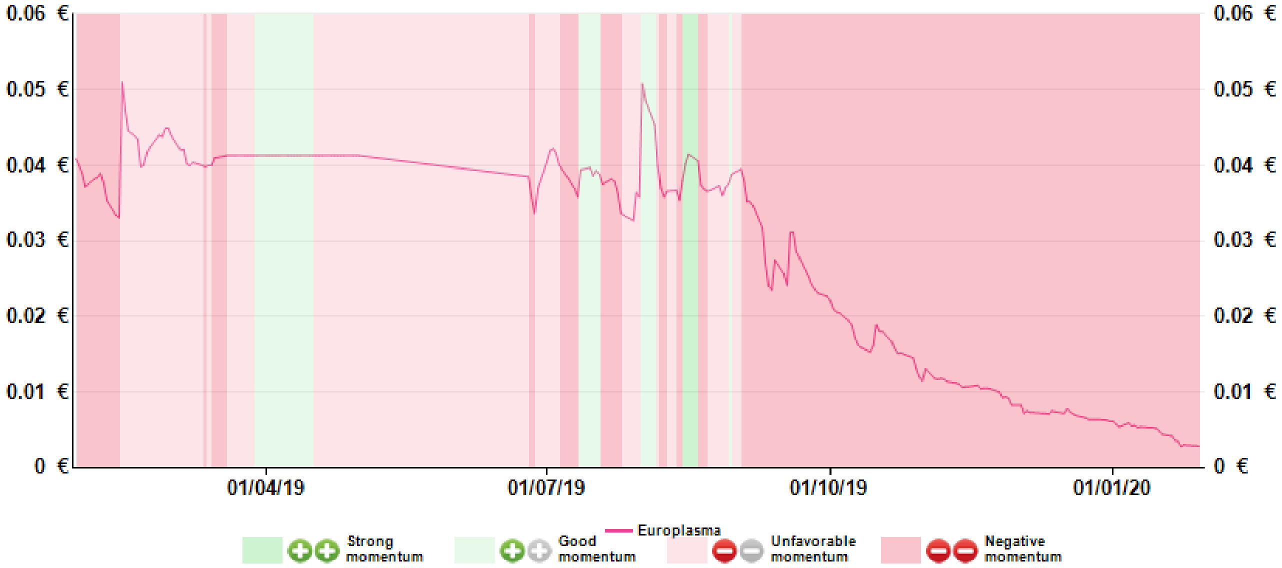


Earnings Per Share & Opinion





Momentum



Momentum analysis consists in evaluating the stock market trend of a given financial instrument, based on the analysis of its trading flows.
The main indicators used in our momentum tool are simple moving averages over three time frames: short term (20 trading days), medium term (50 days) and long term (150 days). The positioning of these moving averages relative to each other gives us the direction of the flows over these time frames.
For example, if the short and medium-term moving averages are above the long-term moving average, this suggests an uptrend which will need to be confirmed. Attention is also paid to the latest stock price relative to the three moving averages (advance indicator) as well as to the trend in these three moving averages - downtrend, neutral, uptrend - which is more of a lagging indicator.
The trend indications derived from the flows through moving averages and stock prices must be confirmed against trading volumes in order to confirm the signal. This is provided by a calculation based on the average increase in volumes over ten weeks together with a buy/sell volume ratio.

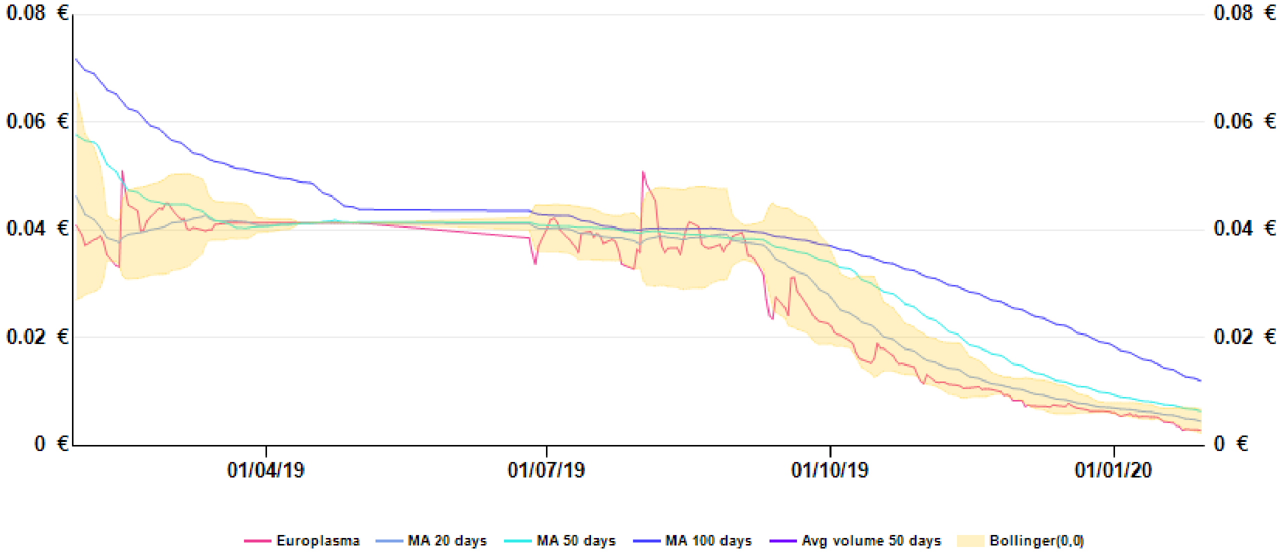
: Strong momentum corresponding to a continuous and overall positive moving average trend confirmed by volumes

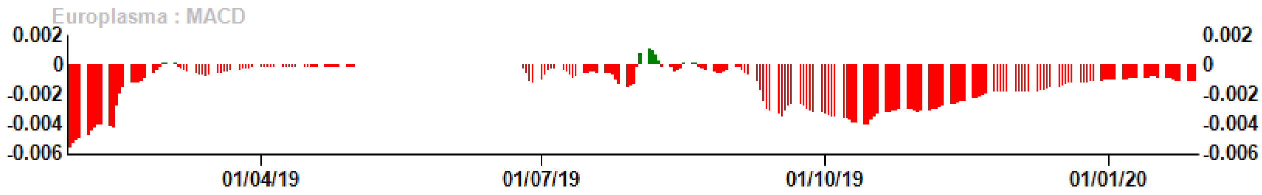
: Relatively good momentum corresponding to a positively-oriented moving average, but offset by an overbought pattern or lack of confirmation from volumes

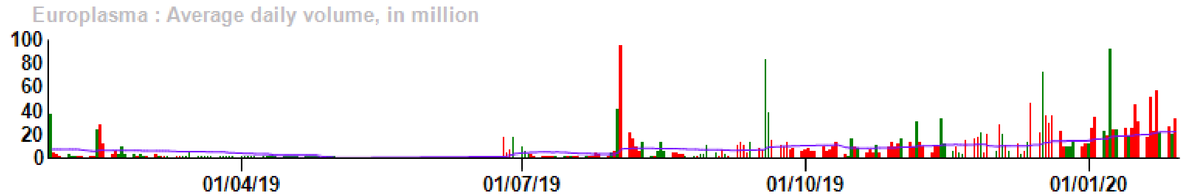
: Relatively unfavorable momentum with a neutral or negative moving average trend, but offset by an oversold pattern or lack of confirmation from volumes

: Strongly negative momentum corresponding to a continuous and overall negative moving average trend confirmed by volumes

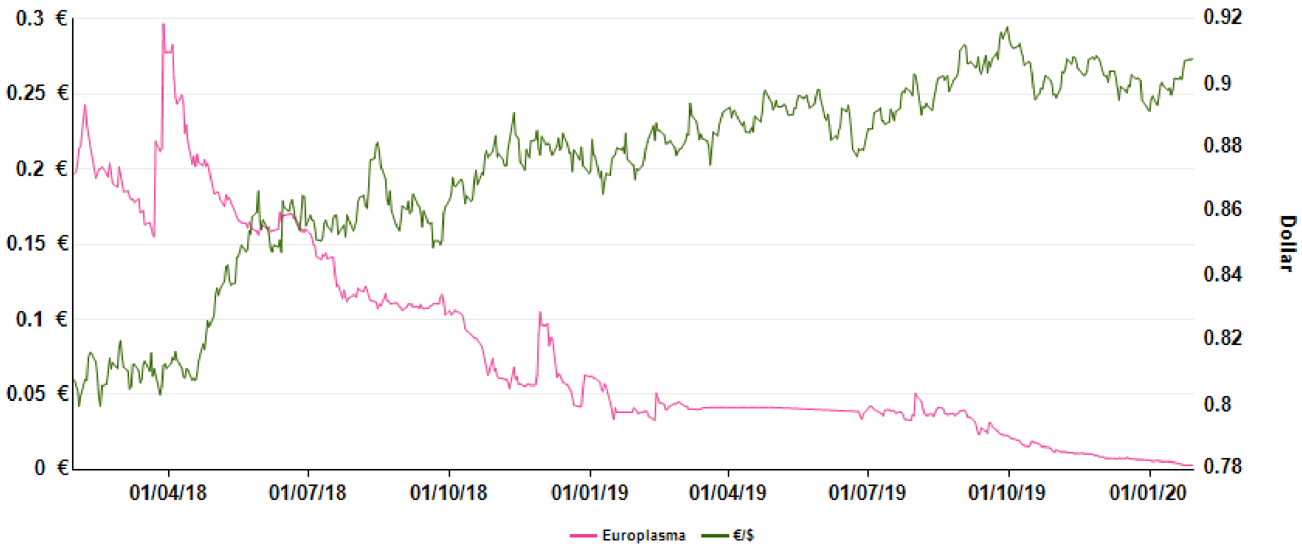
Moving Average MACD & Volume



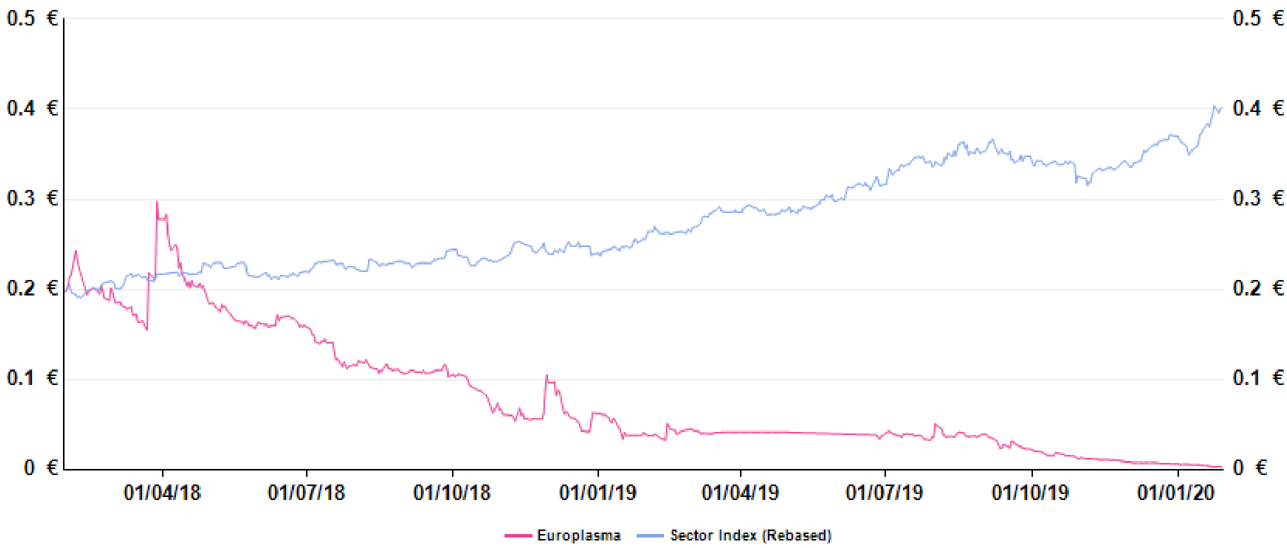




€/$ sensitivity



Sector Utilities



Detailed Financials

Valuation Key Data

Valuation Key Data		12/17A	12/18E	12/19E	12/20E
Adjusted P/E	**x**	**-1.31**	**-1.67**	**-4.99**	**0.52**
Reported P/E	x	-1.47	-2.20	-6.83	0.52
EV/EBITDA(R)	**x**	**-5.03**	**-24.8**	**23.6**	**9.55**
P/Book	**x**	**-2.11**	**-2.73**	**-12.3**	**0.17**
Dividend yield	**%**	**0.00**	**0.00**	**0.00**	**0.00**
Free cash flow yield	*%*	*-37.8*	*-55.6*	*-237*	*-2,989*
Average stock price	€	0.21	0.08	0.04	0.00

Consolidated P&L

Consolidated P&L		12/17A	12/18E	12/19E	12/20E
Sales	€th	13,133	14,000	24,560	45,160
Sales growth	*%*	*34.9*	*6.60*	*75.4*	*83.9*
Sales per employee	*€th*	*119*	*122*	*175*	*251*
Organic change in sales	*%*				
Purchases and external costs (incl. IT)	€th				
Staff costs	€th	-8,607	-8,998	-10,955	-14,085
Operating lease payments	€th				
Cost of sales/COGS (indicative)	€th				
EBITDA	€th	-8,057 (5)	-3,700	6,832	17,936
EBITDA(R)	€th	-8,057	-3,700	6,832	17,936
EBITDA(R) margin	*%*	*-61.3*	*-26.4*	*27.8*	*39.7*
EBITDA(R) per employee	*€th*	*-73.2*	*-32.2*	*48.8*	*99.6*
Depreciation	€th	-2,818	-4,925	-6,050	-7,175
Depreciations/Sales	*%*	*21.5*	*35.2*	*24.6*	*15.9*
Amortisation	€th	-2,924	0.00	0.00	0.00
Additions to provisions	€th	0.00	0.00	0.00	0.00
Reduction of provisions	€th	0.00	0.00	0.00	0.00
Underlying operating profit	€th	-13,799	-8,625	782	10,761
Underlying operating margin	*%*	*-105*	*-61.6*	*3.19*	*23.8*
Other income/expense (cash)	€th	359	0.00	0.00	0.00
Other inc./ exp. (non cash; incl. assets revaluation)	€th				
Earnings from joint venture(s)	€th				
Impairment charges/goodwill amortisation	€th	-656			
Operating profit (EBIT)	€th	-14,096	-8,625	782	10,761
Interest expenses	€th	-770	-2,500	-4,000	-5,500
of which effectively paid cash interest expenses	*€th*	*300*	*-2,500*	*-4,000*	*-5,500*
Financial income	€th	225	0.00	0.00	0.00
Other financial income (expense)	€th	-309	0.00	0.00	0.00
Net financial expenses	€th	-854	-2,500	-4,000	-5,500
of which related to pensions	*€th*		*0.00*	*0.00*	*0.00*
Pre-tax profit before exceptional items	€th	-14,950	-11,125	-3,218	5,261
Exceptional items and other (before taxes)	€th				
of which cash (cost) from exceptionals	*€th*				
Current tax	€th	30.0	0.00	965	-1,578
Impact of tax loss carry forward	€th		0.00	-965 (6)	1,578 (6)
Deferred tax	€th		0.00		
Corporate tax	€th	30.0	0.00	0.00	0.00
Tax rate	*%*	*0.21*	*0.00*	*0.00*	*0.00*
Net margin	*%*	*-114*	*-79.5*	*-13.1*	*11.7*
Equity associates	€th	-6,900 (7)	0.00	0.00	0.00
Actual dividends received from equity holdings	*€th*				
Minority interests	€th	0.00	45.6	-524	-1,844
Actual dividends paid out to minorities	*€th*				

5. Adjusted figure as the reported Ebitda (€-14m) is useless as it takes on board equity accounted earnings

6. We allow for the use of tax loss carry forwards to keep the effective tax close to zero

7. This amount refers to a mark to market of the 35% owned in CHOMorcenx. The capitalisation of interest expenses over an excessively long period (as the project was delayed by technical hiccups) led to a fixed asset value well in excess of the value implied by its cash flow generation. That has been marked down

Income from discontinued operations	€th				
Attributable net profit	€th	-21,820	-11,079	-3,742	3,417
Impairment charges/goodwill amortisation	€th	656	0.00	0.00	0.00
Other adjustments	€th				
Adjusted attributable net profit	€th	-21,164	-11,079	-3,742	3,417
Interest expense savings	€th				
Fully diluted adjusted attr. net profit	€th	-21,164	-11,079	-3,742	3,417
NOPAT	€th	-16,559	-6,038	548	7,533

Cashflow Statement

Cashflow Statement		12/17A	12/18E	12/19E	12/20E
EBITDA	€th	-8,057	-3,700	6,832	17,936
Change in WCR	€th	1,667	-848	-1,500	-2,000
of which (increases)/decr. in receivables	*€th*	*2,545*	*-2,617*	*-2,000*	*-2,000*
of which (increases)/decr. in inventories	*€th*	*327*	*-1,401*	*-1,000*	*0.00*
of which increases/(decr.) in payables	*€th*	*95.0*	*2,866*	*1,000*	*0.00*
of which increases/(decr.) in other curr. liab.	*€th*	*-1,300*	*304*	*500*	*0.00*
Actual dividends received from equity holdings	€th	0.00	0.00	0.00	0.00
Paid taxes	€th	421	0.00	0.00	0.00
Exceptional items	€th				
Other operating cash flows	€th	-2,200	1,000	1,000	1,000
Total operating cash flows	€th	-8,169	-3,548	6,332	16,936
Capital expenditure	€th	-3,100	-7,500 (8)	-63,000 (8)	-65,000 (8)
Capex as a % of depreciation & amort.	*%*	*54.0*	*152*	*1,041*	*906*
Net investments in shares	€th	0.00	0.00	0.00	0.00
Other investment flows	€th	-700	-1,000	-1,000	-1,000
Total investment flows	€th	-3,800	-8,500	-64,000	-66,000
Net interest expense	€th	-854	-2,500	-4,000	-5,500
of which cash interest expense	*€th*	*300*	*-2,500*	*-4,000*	*-5,500*
Dividends (parent company)	€th				
Dividends to minorities interests	€th	0.00	0.00	0.00	0.00
New shareholders' equity	€th	14,200	6,000	6,000	16,000
of which (acquisition) release of treasury shares	*€th*				
(Increase)/decrease in net debt position	€th	-2,200	10,200	28,000	45,000
Other financial flows	€th		-13,000 (9)	10,000 (10)	10,000 (10)
Total financial flows	€th	12,300	700	40,000	65,500
Change in cash position	€th	331	-11,348	-17,668	16,436
Change in net debt position	€th	2,531	-21,548	-45,668	-28,564
Free cash flow (pre div.)	€th	-12,123	-13,548	-60,668	-53,564
Operating cash flow (clean)	€th	-8,169	-3,548	6,332	16,936
Reinvestment rate (capex/tangible fixed assets)	*%*	*23.2*	*14.7*	*53.8*	*37.1*

8. Big surge in capex as new power plants are fully consolidated (€60m per unit). Actual capex is pushed back by 6 months on financing constraints
9. Scope of consolidation change in 2018 when Europlasma took majority control of its power generation unit and thus embarked on new debt
10. Cash injections by 49% holders of the equity of new power SPVs

Balance Sheet

		12/17A	12/18E	12/19E	12/20E
Goodwill	€th	8.00	1,000	1,000	1,000
Other intangible assets	€th	193	314	314	500
Total intangible	€th	201	1,314	1,314	1,500
Tangible fixed assets	€th	13,341	51,000 (11)	111,000 (11)	165,000 (11)
Financial fixed assets (part of group strategy)	€th	0.00	8,000	10,000	10,000
Other financial assets (investment purpose mainly)	€th	2,763	6,000	6,000	6,000
WCR	€th	1,152	2,000	3,500	5,500
of which trade & receivables (+)	*€th*	*6,383*	*9,000*	*11,000*	*13,000*
of which inventories (+)	*€th*	*1,599*	*3,000*	*4,000*	*4,000*
of which payables (+)	*€th*	*4,134*	*7,000*	*8,000*	*8,000*
of which other current liabilities (+)	*€th*	*2,696*	*3,000*	*3,500*	*3,500*
Other current assets	€th	10,842	4,000	5,000	5,000
of which tax assets (+)	*€th*	*430*	*1,000*	*1,000*	*1,000*
Total assets (net of short term liabilities)	€th	28,299	72,314	136,814	193,000
Ordinary shareholders' equity (group share)	€th	-15,224	-8,909	-2,077	10,546
Minority interests	€th	31.0	20,000 (12) (13)	30,000 (13)	40,000 (13)
Provisions for pensions	€th	573	0.00	0.00	0.00
Other provisions for risks and liabilities	€th	8,169	12,000	15,000	20,000
Deferred tax liabilities	€th	115	-2,000	-2,000	-2,000
Other liabilities	€th	20,972	16,000	15,000	15,000
Net debt / (cash)	€th	13,675	35,223	80,891	109,454
Total liabilities and shareholders' equity	€th	28,311	72,314	136,814	193,000
Average net debt / (cash)	€th	11,088	24,449	58,057	95,173

11. Surge in capex relates to the full consolidation of power production SPVs (c. €60m capex per unit; two years of construction)
12. 20% of CHO Power owned by Gottex from April 2018
13. Build up of minority interests in new SPVs (assumption is €10m/SPV)

EV Calculations

		12/17A	12/18E	12/19E	12/20E
EV/EBITDA(R)	**x**	**-5.03**	**-24.8**	**23.6**	**9.55**
EV/EBIT (underlying profit)	**x**	**-2.94**	**-10.6**	**ns**	**15.9**
EV/Sales	**x**	**3.08**	**6.54**	**6.57**	**3.79**
EV/Invested capital	x	2.76	1.47	1.28	0.94
Market cap	€th	32,092	24,357	25,571	1,792
+ Provisions (including pensions)	€th	8,742	12,000	15,000	20,000
+ Unrecognised actuarial losses/(gains)	€th	0.00	0.00	0.00	0.00
+ Net debt at year end	€th	13,675	35,223	80,891	109,454
+ Leases debt equivalent	€th	0.00	0.00	0.00	0.00
- Financial fixed assets (fair value) & Others	€th	15,000	0.00	0.00	0.00
+ Minority interests (fair value)	€th	1,000	20,000	40,000	40,000
= Enterprise Value	**€th**	**40,509**	**91,580**	**161,461**	**171,246**

Per Share Data

		12/17A	12/18E	12/19E	12/20E
Adjusted EPS (bfr gwill amort. & dil.)	**€**	**-0.16**	**-0.05**	**-0.01**	**0.01**
Growth in EPS	*%*	*n/a*	*n/a*	*n/a*	*n/a*
Reported EPS	€	-0.14	-0.04	-0.01	0.01
Net dividend per share	**€**	**0.00**	**0.00**	**0.00**	**0.00**
Free cash flow per share	€	-0.09	-0.06	-0.13	-0.08
Operating cash flow per share	€	-0.06	-0.02	0.01	0.03
Book value per share	€	-0.10	-0.03	0.00	0.02
Number of ordinary shares	**Th**	**152,405** (14)	**294,000** (15)	**640,000**	**640,000**
Number of equivalent ordinary shares (year end)	Th	152,405	294,000	640,000	640,000
Number of shares market cap.	Th	152,400	254,000	300,000	500,000
Treasury stock (year end)	Th				
Number of shares net of treasury stock (year end)	Th	152,405	294,000	640,000	640,000
Number of common shares (average)	**Th**	**132,028**	**223,203**	**467,000**	**640,000**
Conversion of debt instruments into equity	Th	0.00 (16)	0.00 (16)	0.00	0.00
Settlement of cashable stock options	Th	0.00 (17)	0.00 (17)	0.00	0.00
Probable settlement of non mature stock options	Th				
Other commitments to issue new shares	Th	0.00	0.00	0.00	0.00
Increase in shares outstanding (average)	Th	0.00	0.00	0.00	0.00
Number of diluted shares (average)	**Th**	**132,028**	**223,203**	**467,000**	**640,000**
Goodwill per share (diluted)	€	0.00	0.00	0.00	0.00
EPS after goodwill amortisation (diluted)	€	-0.17	-0.05	-0.01	0.01
EPS before goodwill amortisation (non-diluted)	€	-0.17	-0.05	-0.01	0.01
Actual payment	€				
	%	**0.00**	**0.00**	**0.00**	**0.00**
Capital payout ratio (div +share buy back/net income)	**%**	**0.00**	**0.00**	**0.00**	

14. Including A warrants of 2014
15. We assume that the necessary recapitalisaton will be achieved above the nominal value (€0.1/share) as the erosion in the share price reflects liquidity concerns rather than a change in the enterprise value. We used €0.15 as an issue price
16. Convertible issue in late 2015 with a coupon in shares has been allowed for as being repaid in full implying the issuance of c.40m new shares from 2018.
17. New C warrants issued in October 2017 with a strike price at €0.32 up to 30/06/2018, and €0.75 thereafter up to 31/12/2018. We assume that they are exercised

Funding - Liquidity

Funding - Liquidity		12/17A	12/18E	12/19E	12/20E
EBITDA	€th	-8,057 (5)	-3,700	6,832	17,936
Funds from operations (FFO)	€th	-9,536	-5,200	3,832	13,436
Ordinary shareholders' equity	**€th**	**-15,224**	**-8,909**	**-2,077**	**10,546**
Gross debt	€th	21,800	32,000	60,000	105,000
o/w Less than 1 year - Gross debt	€th	3,000	5,000		
o/w 1 to 5 year - Gross debt	€th	15,800			
of which Y+2	€th	6,200			
of which Y+3	€th	1,000			
o/w Beyond 5 years - Gross debt	€th	3,000	27,000 (18)	60,000 (18)	105,000 (18)
+ Gross Cash	€th	8,125	-3,223	-20,891	-4,454
= Net debt / (cash)	**€th**	**13,675**	**35,223**	**80,891**	**109,454**
Bank borrowings	€th	2,000	2,000	10,000	10,000
Issued bonds	€th	5,000 (19)	5,000		
Financial leases liabilities	€th		25,000	45,000	90,000
Other financing	€th	14,800	0.00	5,000	5,000
Gearing (at book value)	%				902
Adj. Net debt/EBITDA(R)	*x*	*-1.70*	*-9.52*	*11.8*	*6.10*
Adjusted Gross Debt/EBITDA(R)	*x*	*-3.79*	*-11.9*	*11.0*	*6.97*
Adj. gross debt/(Adj. gross debt+Equity)	*%*	*199*	*125*	*103*	*92.2*
Ebit cover	*x*	*-16.2*	*-3.45*	*0.20*	*1.96*
FFO/Gross Debt	*%*	*-31.2*	*-11.8*	*5.11*	*10.7*
FFO/Net debt	*%*	*-69.7*	*-14.8*	*4.74*	*12.3*
FCF/Adj. gross debt (%)	*%*	*-39.7*	*-30.8*	*-80.9*	*-42.9*
(Gross cash+ "cash" FCF+undrawn)/ST debt	*x*	*-1.33*	*-3.35*		
"Cash" FCF/ST debt	*x*	*-3.66*	*-2.71*		

5. Adjusted figure as the reported Ebitda (€-14m) is useless as it takes on board equity accounted earnings

18. The profile of debt funding has to be determined

19. 3-year €5m convertible at 6% coupon paid in new shares

ROE Analysis (Dupont's Breakdown)

ROE Analysis (Dupont's Breakdown)		12/17A	12/18E	12/19E	12/20E
Tax burden (Net income/pretax pre excp income)	x	1.46	1.00	1.16	0.65
EBIT margin (EBIT/sales)	%	-107	-61.6	3.19	23.8
Assets rotation (Sales/Avg assets)	%	48.6	27.8	23.5	27.4
Financial leverage (Avg assets /Avg equity)	x	-2.87	-4.17	-19.0	38.9
ROE	**%**	**232**	**91.8**	**68.1**	**80.7**
ROA	%	-95.9	-15.9	0.68	6.26

Shareholder's Equity Review (Group Share)

Shareholder's Equity Review (Group Share)		12/17A	12/18E	12/19E	12/20E
Y-1 shareholders' equity	€th	-3,892	-15,212	-8,909	-2,077
+ Net profit of year	€th	-21,820	-11,079	-3,742	3,417
- Dividends (parent cy)	€th	0.00	0.00	0.00	0.00
+ Additions to equity	€th	14,200	6,000	6,000	16,000
o/w reduction (addition) to treasury shares	*€th*	*0.00*	*0.00*	*0.00*	*0.00*
- Unrecognised actuarial gains/(losses)	€th	0.00	0.00	0.00	0.00
+ Comprehensive income recognition	€th	-3,700	11,382	4,574	-6,795
= Year end shareholders' equity	**€th**	**-15,212**	**-8,909**	**-2,077**	**10,546**

Staffing Analytics

		12/17A	12/18E	12/19E	12/20E
Sales per staff	€th	119	122	175	251
Staff costs per employee	€th	-78.2	-78.2	-78.2	-78.2
Change in staff costs	*%*	*0.00*	*4.55*	*21.7*	*28.6*
Change in unit cost of staff	*%*	*0.00*	*0.00*	*0.00*	*0.00*
Staff costs/(EBITDA+Staff costs)	*%*	*1,564*	*170*	*61.6*	*44.0*
Average workforce	**unit**	**110**	**115**	**140**	**180**
Europe	unit	110	115	140	180
North America	unit	0.00	0.00	0.00	0.00
South Americas	unit	0.00	0.00	0.00	0.00
Asia	unit	0.00	0.00	0.00	0.00
Other key countries	unit	0.00	0.00	0.00	0.00
Total staff costs	**€th**	**-8,607**	**-8,998**	**-10,955**	**-14,085**
Wages and salaries	€th	-8,607	-8,998	-10,955	-14,085
of which social security contributions	*€th*	*-3,000*	*-3,000*	*-3,000*	*-3,000*
Equity linked payments	€th				
Pension related costs	€th		0.00	0.00	0.00

Divisional Breakdown Of Revenues

		12/17A	12/18E	12/19E	12/20E
Total sales	**€th**	**13,133**	**14,000**	**24,560**	**45,160**
Engineering, Torch (Europlasma)	€th	1,343	1,000	3,000	4,000
Renewable Energy (CHO-POWER)	€th	4,356	4,000	10,560	28,160
Toxic Waste Neutralization (Inertam)	€th	7,434	9,000	11,000	13,000
Air & Gaz (Europe Environnement)	€th	0.00	0.00	0.00	0.00
Other	€th	0.00	0.00	0.00	0.00

Divisional Breakdown Of Earnings

		12/17A	12/18E	12/19E	12/20E
Operating results Analysis					
Holding, R&D, Engineering, Torch (Europlasma)	€th	-3,496	-4,200	-3,600	-3,300
Renewable Energy (CHO-POWER)	€th	-6,324	-3,125	3,932	13,111
Toxic Waste Neutralization (Inertam)	€th	-4,277	-1,300	450	950
Air & Gaz (Europe Environnement)	€th	0.00	0.00	0.00	0.00
Other/cancellations	€th	0.00	0.00	0.00	0.00
Total	**€th**	**-14,097**	**-8,625**	**782**	**10,761**
Operating results margin	%	-107	-61.6	3.19	23.8

Revenue Breakdown By Country

		12/17A	12/18E	12/19E	12/20E
Europe	%	90.0	90.0		
Americas	%	0.00	0.00		
Asia	%	10.0	10.0		
Other	%	0.00	0.00		

ROCE/CFROIC/Capital Invested

		12/17A	12/18E	12/19E	12/20E
ROCE (NOPAT+lease exp.(1-tax))/(net) cap employed adjusted*	*%*	*-113*	*-9.69*	*0.44*	*4.14*
CFROIC	*%*	*-82.5*	*-21.7*	*-48.2*	*-29.4*
Goodwill	€th	8.00	1,000	1,000	1,000
Accumulated goodwill amortisation	*€th*	*0.00*	*0.00*	*0.00*	*0.00*
All intangible assets	€th	193	314	314	500
Accumulated intangible amortisation	*€th*	*0.00*	*0.00*	*0.00*	*0.00*
Financial hedges (LT derivatives)	€th	0.00	0.00	0.00	0.00
Capitalised R&D	€th	0.00	0.00	0.00	0.00
PV of non-capitalised lease obligations	€th	0.00	0.00	0.00	0.00
Other fixed assets	€th	13,341	51,000	111,000	165,000
Accumulated depreciation	*€th*	*0.00*	*0.00*	*6,000*	*10,000*
WCR	€th	1,152	2,000	3,500	5,500
Other assets	€th	0.00	8,000	10,000	10,000
Unrecognised actuarial losses/(gains)	€th	0.00	0.00	0.00	0.00
Capital employed after deprec. (Invested capital)	**€th**	**14,694**	**62,314**	**125,814**	**182,000**
Capital employed before depreciation	€th	14,694	62,314	131,814	192,000

Divisional Breakdown Of Capital

		12/17A	12/18E	12/19E	12/20E
Holding, R&D, Engineering, Torch (Europlasma)	€th				
Renewable Energy (CHO-POWER)	€th				
Toxic Waste Neutralization (Inertam)	€th				
Air & Gaz (Europe Environnement)	€th				
Other	€th	14,694	62,314	125,814	182,000
Total capital employed	**€th**	**14,694**	**62,314**	**125,814**	**182,000**

Pension Risks

Summary Of Pension Risks

		12/17A	12/18E	12/19E	12/20E
Pension ratio	**%**	**0.00**	**0.00**	**0.00**	**0.00**
Ordinary shareholders' equity	€th	-15,224	-8,909	-2,077	10,546
Total benefits provisions	**€th**	**0.00**	**0.00**	**0.00**	**0.00**
of which funded pensions	*€th*	*0.00*	*0.00*	*0.00*	*0.00*
of which unfunded pensions	*€th*	*0.00*	*0.00*	*0.00*	*0.00*
of which benefits / health care	*€th*		*0.00*	*0.00*	*0.00*
Unrecognised actuarial (gains)/losses	€th	0.00	0.00	0.00	0.00
Company discount rate	*%*	*4.60*	*4.60*	*4.60*	*4.60*
Normalised recomputed discount rate	%		1.50		
Company future salary increase	*%*	*3.00*	*3.00*	*3.00*	*3.00*
Normalised recomputed future salary increase	%		2.00		
Company expected rate of return on plan assets	*%*	*6.00*	*6.00*	*6.00*	*6.00*
Normalised recomputed expd rate of return on plan assets	%		1.50		
Funded : Impact of actuarial assumptions	**€th**		**0.00**		
Unfunded : Impact of actuarial assumptions	**€th**		**0.00**		

Geographic Breakdown Of Pension Liabilities

		12/17A	12/18E	12/19E	12/20E
US exposure	%				
UK exposure	%				
Euro exposure	%	100	100	100	100
Nordic countries	%				
Switzerland	%				
Other	%				
Total	%	100	100	100	100

Balance Sheet Implications

		12/17A	12/18E	12/19E	12/20E
Funded status surplus / (deficit)	€th	0.00	0.00	0.00	0.00
Unfunded status surplus / (deficit)	€th	0.00	0.00	0.00	0.00
Total surplus / (deficit)	€th	0.00	0.00	0.00	0.00
Total unrecognised actuarial (gains)/losses	**€th**	**0.00**	**0.00**	**0.00**	**0.00**
Provision (B/S) on funded pension	€th	0.00	0.00	0.00	0.00
Provision (B/S) on unfunded pension	€th	0.00	0.00	0.00	0.00
Other benefits (health care) provision	€th		0.00	0.00	0.00
Total benefit provisions	**€th**	**0.00**	**0.00**	**0.00**	**0.00**

P&L Implications

		12/17A	12/18E	12/19E	12/20E
Funded obligations periodic costs	€th	0.00	0.00	0.00	0.00
Unfunded obligations periodic costs	€th	0.00	0.00	0.00	0.00
Total periodic costs	**€th**	**0.00**	**0.00**	**0.00**	**0.00**
of which incl. in labour costs	*€th*	*0.00*	*0.00*	*0.00*	*0.00*
of which incl. in interest expenses	*€th*	*0.00*	*0.00*	*0.00*	*0.00*

Funded Obligations

		12/17A	12/18E	12/19E	12/20E
Balance beginning of period	**€th**	**0.00**	**0.00**	**0.00**	**0.00**
Current service cost	€th		0.00	0.00	0.00
Interest expense	€th		0.00	0.00	0.00
Employees' contributions	€th				
Impact of change in actuarial assumptions	€th		0.00	0.00	0.00
of which impact of change in discount rate	*€th*		*0.00*		
of which impact of change in salary increase	*€th*		*0.00*		
Changes to scope of consolidation	**€th**				
Currency translation effects	€th				
Pension payments	€th				
Other	€th				
Year end obligation	**€th**	**0.00**	**0.00**	**0.00**	**0.00**

Plan Assets

		12/17A	12/18E	12/19E	12/20E
Value at beginning	**€th**		**0.00**	**0.00**	**0.00**
Company expected return on plan assets	€th		0.00	0.00	0.00
Actuarial gain /(loss)	€th		0.00	0.00	0.00
Employer's contribution	€th	0.00	0.00	0.00	0.00
Employees' contributions	€th	0.00	0.00	0.00	0.00
Changes to scope of consolidation	€th				
Currency translation effects	€th				
Pension payments	€th	0.00	0.00	0.00	0.00
Other	€th				
Value end of period	**€th**	**0.00**	**0.00**	**0.00**	**0.00**
Actual and normalised future return on plan assets	€th	0.00	0.00	0.00	0.00

Unfunded Obligations

		12/17A	12/18E	12/19E	12/20E
Balance beginning of period	**€th**	**0.00**	**0.00**	**0.00**	**0.00**
Current service cost	€th		0.00	0.00	0.00
Interest expense	€th		0.00	0.00	0.00
Employees' contributions	€th				
Impact of change in actuarial assumptions	€th		0.00	0.00	0.00
of which Impact of change in discount rate	*€th*		*0.00*		
of which Impact of change in salary increase	*€th*		*0.00*		
Changes to scope of consolidation	€th				
Currency translation effects	€th				
Pension payments	€th				
Other	€th				
Year end obligation	**€th**	**0.00**	**0.00**	**0.00**	**0.00**

Fundamental Opinion

It is implicit that recommendations are made in good faith but should not be regarded as the sole source of advice.

Recommendations are geared to a "**value**" approach.

Valuations are computed from the point of view of a **secondary market minority holder** looking at a medium term (say 6 months) performance.

Valuation tools are built around the concepts of **transparency,** all underlying figures are accessible, and **consistency,** same methodology whichever the stock, allowing for differences in nature between financial and non financial stocks. A stock with a target price below its current price should not and will not be regarded as an Add or a Buy.

Recommendations are based on target prices with no allowance for dividend returns. The thresholds for the four recommendation levels may change from time to time depending on market conditions. Thresholds are defined as follows, ASSUMING long risk free rates remain in the 2-5% region.

Recommendation	Low Volatility 10 < VIX index < 30	Normal Volatility 15 < VIX index < 35	High Volatility 35 < VIX index
Buy ●	More than 15% upside	More than 20% upside	More than 30% upside
Add ●	From 5% to 15%	From 5% to 20%	From 10% to 30%
Reduce ●	From -10% to 5%	From -10% to 5%	From -10% to 10%
Sell ●	Below -10%	Below -10%	Below -10%

There is deliberately no "neutral" recommendation. The principle is that there is no point investing in equities if the return is not at least the risk free rate (and the dividend yield which again is not allowed for).

Although recommendations are automated (a function of the target price whenever a new equity research report is released), the management of AlphaValue intends to maintain global consistency within its universe coverage and may, from time to time, decide to change global parameters which may affect the level of recommendation definitions and /or the distribution of recommendations within the four levels above. For instance, lowering the risk premium in a gloomy context may increase the proportion of positive recommendations.

Valuation

Valuation processes have been organized around transparency and consistency as primary objectives.

Stocks belong to different categories that recognise their main operating features : Banks, Insurers and Non Financials.

Within those three universes, the valuation techniques are the same and in relation to the financial data available.

The weighting given to individual valuation techniques is managed centrally and may be changed from time to time. As a rule, all stocks of a similar profile are valued using equivalent weighting of the various valuation techniques. This is for obvious consistency reasons.

Within the very large universe of Non Financials, there are in effect 4 sub-categories of weightings to cater for subsets: 1) 'Mainstream' stocks; 2) 'Holding companies' where the stress is on NAV measures; 3) 'Growth' companies where the stress is on peer based valuations; 4) 'Loss making sectors' where peers review is essentially pointing nowhere (ex: Bio techs). The bulk of the valuation is then built on DCF and NAV, in effect pushing back the time horizon.

Valuation Issue	Normal industrials	Growth industrials	Holding company	Loss runners	Bank	Insurers
DCF	35%	35%	10%	40%	0%	0%
NAV	20%	20%	55%	40%	50%	15%
PE	10%	10%	10%	5%	10%	20%
EV/EBITDA	20%	20%	0%	5%	0%	0%
Yield	10%	10%	20%	5%	10%	15%
Book	5%	5%	5%	5%	10%	10%
Banks' instrinsic method	0%	0%	0%	0%	10%	0%
Embedded Value	0%	0%	0%	0%	0%	40%
Mkt Cap/Gross Operating Profit	0%	0%	0%	0%	10%	0%