EDISON

Deinove

Long-term outlook

Quest for commercial revenue

Alternative energy

Commercial agreements with blue-chip industrials partners offer the prospect of entry into key markets for Deinove. To capitalise on this opportunity Deinove must demonstrate that its technology can operate successfully on an industrial scale and using industrial substrates in its chosen markets. Confirmation of its ability to scale up its technology could act as a significant boost to its share price.

Year end	Revenue (€m)	PBT* (€m)	EPS* (c)	DPS (c)	P/E (x)	Yield (%)
12/13	0.1	(5.0)	(61.5)	0.0	N/A	N/A
12/14	0.2	(6.6)	(98.6)	0.0	N/A	N/A
12/15e	0.2	(8.3)	(104.7)	0.0	N/A	N/A
12/16e	0.2	(8.6)	(93.4)	0.0	N/A	N/A

Note: *PBT and EPS are normalised, excluding intangible amortisation, exceptional items and share-based payments.

Scale-up of technology is required

Deinove has continued to make progress scientifically and commercially against a background of less favourable core markets. Despite a lower oil price we anticipate that the second-generation biofuel market will continue to grow – albeit less rapidly than previously envisaged – and competing technology has yet to establish itself, so the market opportunity remains. Agreements with commercial partners in both the Deinol and Deinochem projects provide Deinove with entry points to its chosen markets, but it will need to establish the commerciality of its technology on an industrial scale to assist the development of its share price.

Price competitiveness principal risk

The principal risk facing Deinove is that its technological developments are insufficiently price competitive for industrial deployment. Our assessment of the valuation of the business would also be jeopardised by slippage in the timetable for deployment. Deinove believes that, courtesy of its funding agreement with Kepler Cheuvreux, it has sufficient financial resources to fund the business beyond Q316. However, clearly any delays to the commercialisation of its technology could require further equity injections. Weakening of incentive programmes for biofuels and a further drop in the oil price could also pose a threat to the business.

Valuation: Discounting the cash flows

Deinove remains at a pre-revenue (commercial) stage and we therefore believe that a cash flow analysis is the most appropriate method for providing valuation benchmarks. We assume that Deinove proceeds to successful commercial deployment of its technology in both biofuels and green chemistry. The analysis of course remains highly dependent on the assumptions used and we set these out in more detail in the valuation section of this report. Our DCF analysis indicates that at a price of c €8/share and using a discount rate of 11%, the market is assuming a c 35% probability of success. Applying a 15% discount rate to the same cash flows indicates that the market is assuming a c 60% possibility of success.

8 May 2015

Price	**€8.14**
Market cap	**€45m**

Net cash* (€m) at end February 2015 *Company definition	4.1
Shares in issue	5.5m
Free float	46%
Code	ALDEI
Primary exchange	Alternext
Secondary exchange	N/A

Share price performance

%	1m	3m	12m
Abs	(0.6)	21.5	(36.4)
Rel (local)	2.7	14.8	(43.5)

52-week high/low	€14.5 €6.0

Business description

Deinove designs, develops and markets technologies in biofuels and biochemical by harnessing the properties of the Deinococcus bacterium.

Next events

General Assembly	6 May 2015

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Edison profile page

Investment summary

Company description: Advanced biofuels and green chemistry

Deinove possesses a collection of more than 6,000 strains of the Deinococcus bacterium and other UV-resistant strains and is seeking to exploit the properties of the bacteria to develop industrial applications. It is focusing its expertise and energies in specific industrial spheres: second-generation biofuels (Deinol), green chemistry (Deinochem), antibiotics (Deinobiotics) and the remediation of plastics (THANAPLAST – project led by Carbios).

Valuation: Cash flow analysis remains the preferred approach

Given that Deinove remains at a pre-commercial revenue stage we continue to believe that a cash flow analysis remains the most appropriate method for providing valuation benchmarks. The analysis remains highly dependent on the assumptions used and we set out our principal assumptions in the valuation section of this report.

Our DCF analysis indicates that at a price of c €8/share and using a discount rate of 11%, the market is assuming a c 35% probability of success. Applying a 15% discount rate to the same cash flows indicates that the market is assuming a c 60% possibility of success. As Deinove moves closer to commercialising its technology and the market can begin to assume the magnitude of the cash flows with greater certainty, we would expect a progressive decline in the discount rate used.

Financials: First expected significant revenue now 2016

The longer-term commerciality of Deinove's technology is of greater importance in determining the financial future of the business and short-term revenues remain difficult to predict. However, we have made the following assumptions in constructing our short-term forecasts; For FY15 and FY16 we assume c €220k of revenues generated by the provision of research services and we expect SG&A costs of c €8.5m in 2015, rising by inflation thereafter. The agreement signed with Kepler Cheuvreux at the end of 2014 will be fundamental to financing the business and we assume that Deinove issues 2.1m shares at a price of c €7/share to raise the full €15m permissible under the agreement. We assume that in total Deinove raises €6.3m from this source in 2015, with the remainder flowing through in 2016 and 2017.

Sensitivities: Timing and commerciality

There are a number of risks and sensitivities to our forecasts. The principal risk remains that the technology is insufficiently robust or price competitive for commercial deployment. Other risks include: the timing of commercialisation falls behind the expected timetable and/or the incentive programmes, eg for biofuels, are abolished or made less generous. A permanently lower oil price would undermine the economic justification for replacing oil-based products, although in a number of the projects in which Deinove participates it could be argued that consumer preference plays an equally important role in driving demand.

Company description: Bacterial application

The application of its bacterial technology to commercial processes is required to generate meaningful revenue for Deinove. Agreements with industrial partners should help facilitate this process, but Deinove will have to demonstrate that its technology can work on an industrial scale over the next year to 18 months before it is in a position to proceed to commercial deployment and generate royalty payments.

Developing commercial applications from the Deinococcus

Founded in 2006 by Professor Miroslav Radman and Dr Philippe Pouletty, Deinove is seeking to develop commercial applications from its collection of strains of the Deinococcus bacterium. Currently Deinove is focusing on industrial applications in four areas, with second-generation biofuels and green chemistry the main focus, but with additional activity in antibiotics and plastics. The company remains in the research (pre-commercial revenue) stage, although in both biofuels and green chemistry it has entered into partnership agreements with a view to testing its technology on an industrial scale.

The Deinococcus bacterium

Deinococci bacteria are robust and able to withstand harsh fermentation conditions, radiation and solvents that other bacteria might find toxic. The bacteria also have the potential to resist temperatures of 30-60°C and a pH range of 3-10. The robustness of the Deinococcus bacterium and its ability to reassemble the genome when damaged make it an attractive option for industrial applications. Deinove possess a collection of over 6,000 strains of the Deinococcus bacterium and has developed a technology platform that enables it to select the best strain profile, to optimise these in an automated and robotic manner, but also to validate these new production systems under pre-industrial conditions.

Strategy

Deinove is seeking to utilise the properties of the Deinococcus bacteria to develop new technology standards and applications that help meet global challenges. The development of second-generation biofuels through the Deinol project seeks to address the problem of the environmental impact of fossil fuel combustion and the finite supply of oil, while contributing to energy independence and stimulating job creation. Deinochem is pursuing research projects that will allow the development of a green chemistry alternative to chemicals derived from oil-based chemicals. Deinobiotics is seeking to develop new antibiotics that contribute to the fight against antibiotic resistance, while the THANAPLAST project is aiming to improve the life cycle of plastics. Deinove's strategy is to enter agreements with industrial partners, granting them access to its technology and allowing them to significantly improve the economic and environmental performance. In return, Deinove will generate royalty revenue. We anticipate royalty revenue from 2017.

Management

Emmanuel Petiot has led the executive committee of Deinove since joining the company at the beginning of 2013. Before Deinove Mr Petiot worked a director of sales at Novozymes. Since his appointment Mr Petiot has pursued agreements with industrial and commercial partners for the development of Deinove's technology and has been successful in signing agreements with blue-chip companies including Suez Environnement and Abengoa. The management board consists of seven and is headed by Dr Philippe Pouletty, co-founder of the company. A scientific advisory board of 14 provides further academic guidance.

Scaled-up testing – the gateway to commercial revenue

Deinove has made significant progress over the last 18 months, signing agreements with industrial partners and passing research milestones in both the Deinol and Deinochem projects. The backdrop of a lower oil price has clouded the outlook for biofuels and green chemistry although there still appears to be an expectation of growth in the 2G biofuel market, albeit at a more modest rate than previously envisaged. Some competing 2G technologies have already established production facilities, but no dominant technology has yet been established and Deinove believes that its technology offers advantages in terms of cost and diversity of substrate. If Deinol can successfully prove the commerciality of its technology on a variety of substrates in its current phase of testing with commercial partners, particularly on a larger scale than achieved so far, it could begin to generate commercial revenue beyond 2016.

Recent developments

Since the beginning of 2014 Deinove has made progress on both the research and commercial sides of the business. The recent completion of the first stage of the Deinochem programme allowed Deinove to receive the first milestone payment of €1m. Commercial agreements signed with Abengoa, Suez and MBI will allow Deinove to test the efficacy of its approach to generating 2G ethanol on a variety of substrates and could ultimately create a diversity of income generation in the biofuels sector. Deinove believes that commercial income is possible from biofuels from 2017.

Exhibit 1: Significant recent developments

Date	Event
14/04/15	Article published in the "Journal of Applied Microbiology" summarises the potential bio-industrial applications for the Deinococcus
25/02/15	1st patent in the US covering the biofuel production process based on Deinococcus bacteria
21/01/15	Deinove announces completion of first milestone in Deinochem programme.
10/12/14	Issue of patent in China, the fifth of the year.
01/12/14	Deinove secures €15m funding agreement with Kepler.
15/10/14	Agreement signed with MBI to test Deinococcus technology on industrial biomass.
22/09/14	Agreement with Sofiproteol (now known as Avril).
07/07/14	Announcement of the development of the bacteria capable of hydrolysing cellulose in seven days comparable to standard production approach.
06/06/14	Deinove announces the development of the CAD4Bio platform, which enables clients to engineer required bacteria.

Source: Deinove, Edison Investment Research

The outlook for biofuels

Historically the growth in biofuel production has been underpinned by a high oil price, a desire to ensure security of energy supply and a commitment to cut greenhouse gas emissions. In the US, the largest producer of biofuel in the world, the production of ethanol has risen from 175m gallons per year (mgpy) in 1980, to over 14bn gallons per year (bngpy) in 2014. Cellulosic ethanol has also finally begun to gain ground, with 33mg produced in 2014. Last year also saw the commissioning of 2G ethanol plants in the US (POET-DSM and Quad County Corn Processors, each with a plant in Iowa and Abengoa in Kansas and DuPont in Nevada) adding to the existing Beta Renewables plant in Italy. The expectation is for more second generation plants to follow in 2015.

While international agreements to reduce GHG emissions remain in place, enhanced security of energy supply, courtesy of the production of shale gas in the US and a lower global oil price, has clouded the outlook for the production of biofuel. Proposals by the EPA in the US to water down commitments for the production of cellulosic biofuel and reduced blending targets also cast a shadow over the industry in 2014 despite a year of record output. The Energy Information Administration (EIA), a US government body, is now forecasting US consumption of ethanol to reach just under 15bngpy by 2040, only marginally above current levels and well short of the total of

36bngpy envisaged by the Energy Independence and Security Act of 2007 (of which 16bngpy is cellulosic biofuels). The EIA also assumes that wholesale ethanol prices will remain pretty flat, reaching $2.65/gallon by 2040 (2012 prices) compared to $2.58 in 2012.

However, studies such as the OECD-FAO Agricultural Outlook continue to forecast growth for the biofuels sector. In its 2014 Outlook the OECD-FAO expects global production of ethanol to increase to 158bn litres by 2023 (CGAR of 4% 2014-23) with second-generation production growing more rapidly but reaching only 5% of the overall total (c 8bn litres) based on conservative estimates of the likely level of 2G output in Europe and the US. However, these estimates are more conservative than previous projections, which saw ethanol output increasing at a CAGR of over 5% for the period 2013-22. These forecasts also compare to the RFS2 in the USA which calls for 50% of total biofuels to be cellulosic by 2022. In broad terms, there still appears to be an expectation of growth in the 2G biofuel market, but at a more modest rate than previously predicted. The International Energy Agency (IEA), in its central case scenario, projects growth in the consumption of biofuels of 4.7% CAGR for the period 2012-40.

The Deinol project

Deinove claims to have developed a process for the production of second-generation biofuels that possess advantages over existing bioethanol production. The aim of the project is to develop this process into a commercially viable proposition that optimises the yield, minimises the costs and enables utilisation of a range of raw materials. As well as producing bioethanol, the project could give rise to propanol, butanol, isoprenoids and carotenoids (which form part of the Deinochem project). The Deinol project commenced in 2009, but was not officially launched until 2010. It is estimated that in total the programme will cost c €21m, but will benefit from the support of Bpifrance (formally known as OSEO) (€8.9m, of which €6m for Deinove), the French agency for innovation.

Existing production processes require heating the slurry to encourage hydrolysis, followed by cooling to allow fermentation and finally heating again to allow distillation to occur. Deinove's process will effectively combine the processes of hydrolysis and fermentation (minimising the need for enzymes – c 20% of the total costs), and is designed to take place at a constant temperature of 50°C, saving energy and money (c 10% of the cost of production of corn-based ethanol is accounted for by energy costs). Thanks to the Deinococcus' capacity to assimilate both C6 sugars (glucose, from cellulose) and C5 sugars (xylose, arabinose, from hemicellulose) it should allow the use of non-food biomass as feedstock, increasing yields (corn comprises c 70% of the total cost of production for conventional corn-based ethanol) without adding so many commercial enzymes. No first-generation, and not all second-generation technology, allows such diversity of feedstock.

Exhibit 2: Landmarks in the evolution of the Deinol project

Date	Landmark
28/02/2010	Deinol project officially launched.
15/09/2010	Deinove receives €1.4m as the first part of €6m funding package granted by OSEO.
30/05/2011	Deinove receives a further €1.6m from OSEO triggered by the achievement of the first R&D milestone in the Deinol project (strain selection).
13/09/2012	Production of an alcohol content of more than 3% from wheat based biomass marks the achievement of the second milestone and triggers the payment of a further €1.15m.
16/01/2014	The Deinol project produces 9% ethanol by content (volume/volume) with Deinococcus, beyond the level required for industrial exploitation.
03/06/2014	Deinol project signs industrial partnership agreement with Abengoa and Suez.
15/10/2014	Deinove teams up with MBI pioneer of AFEX technology.

Source: Deinove, Edison Investment Research

The Deinol project reached its first project milestone in 2011, that of strain selection, receiving €16m. In 2012 Deinove received a further €1.15m on producing a solution with an alcohol content of more than 3%. Deinove then proceeded to sign collaborative agreements with industrial partners designed to test its technology on a variety of potential second-generation substrates. In 2014

Deinove signed three such partnerships with a view to industrialising its technology: Abengoa, Suez and MBI.

Deinove announced that Abengoa had assumed the role of industrial partner in the Deinol project in June 2014. Abengoa is a leading ethanol producer active in Europe, the US and Brazil. The company currently has a total of 3,275 million litres of installed biofuel production capacity globally (including 100 million litres of second-generation capacity). The agreement with Abengoa lasts for up to 36 months (until June 2017), effectively underpinning the Deinol project. The partnership will focus on the development of processes to digest and convert agricultural residues to ethanol. Deinove will test the efficacy of its bacteria on a variety of substrates (starting with corn stover) supplied by Abengoa. If performances are deemed satisfactory the process will be implemented in full size factories under the terms of a non-exclusive licence agreement. Deinove has stated that commercial revenue is possible from 2017.

Deinove also announced that it has signed a two-year collaborative R&D agreement with Suez Environnement to investigate the potential for producing ethanol from organic waste. Suez Environnement operates water and waste management operations on a global basis collecting waste from c 52 million people. This two-year contract is the first step in a project to explore the potential for development of an industrial sector of waste-to-ethanol transformation by the action of Deinococcus bacteria. Assuming the project is successful, it will provide an effective extension to the Deinol project, enabling substrate diversification and additional revenue streams. Initial co-operative work has confirmed that ethanol can be created from organic waste and the collaborative agreement will now focus on optimising the process to achieve production in 20 litre (and larger) bioreactors.

In October 2014 Deinove signed a technological partnership agreement with MBI, pioneer of AFEX technology, under the terms of which MBI will help Deinove optimise (but not market) its technology. AFEX is an ammonia-based pre-treatment technology for cellulosic biomass. Pre-treatment enables processes to separate the various components of biomass (cellulose, hemicellulose and lignin) enabling enzymes or microorganisms to digest biomass, which is then hydrolysed (cellulose and hemicellulose) into simple sugars. According to Deinove, laboratory tests (20 litre) have demonstrated that Deinococcus assimilates over 95% of the sugars present in AFEX pre-treated biomass and efficiently converts these sugars into ethanol. Although the first tests are positive, they now require scaling up to an industrial scale. Deinove believes that revenues from this technology are possible from 2016.

The Deinol project so far has made significant progress achieving the co-assimilation of glucose and xylose improving productivity and yield. The Deinococcus naturally produces enzymes that break down cellulose and hemicellulose, reducing the need for commercial enzymes and the robust characteristics of the bacteria enable it to withstand the toxicity of inhibitors produced by the pre-treatment process. However, these breakthroughs have been made on a relatively small scale (20 litre or less) and the challenge is now to progress to 200-300 litre and 3.5m^3 fermenters.

Deinochem

The aim of the Deinochem programme (estimated investment of €16m by 2018) is to produce chemical compounds (isoprenoids) using Deinococci bacteria, which can be substituted for compounds that are traditionally sourced from oil or extracted from plants. Deinove plans to bring at least two isoprenoid compounds to a pre-industrial validation phase within three and a half years. In September 2013, the Deinochem project secured funding of €5.9m from Ademe (the French Environment and Energy Management Agency), and the General Investment Commission (CGI). The three-and-a-half-year programme received an initial payment of €1.48m and then the first instalment of funding of €1m in January 2015, having passed the first milestone of the project: the modification of the genome to make the strain produce isoprenoids.

Isoprenoids are a large (more than 22,000 isoprenoid compounds) and diverse family of compounds that includes linalool and geraniol, and isoprene itself. These compounds are used in industrial applications such as cosmetics, fragrances, food, feed and rubber. Linalool, geraniol, myrcene are used in perfumes, cosmetics or household products. Carotenoids belong to the category of tetraterpenoids (ie they contain 40 carbon atoms, being built from four terpene units each containing 10 carbon atoms). Carotenoids are yellow/reddish in appearance and are used in food and animal feed for their antioxidant qualities. Isoprene is the smallest isoprenoid. It is mainly used for the production of tyres (synthetic rubber) and a variety of coating materials, as well as in adhesives.

Isoprene (C_5H_8) is a volatile liquid produced naturally from plants and commercially as a by-product of processing petroleum. Isoprenes are the building block of isoprenoids, also known as terpenes (most Deinococcus bacteria accumulate and secrete large amounts of terpenes). Isoprene is used chiefly to manufacture rubbers, but also has a wide range of industrial applications including sealants, adhesives, fragrances and detergents. Existing methods of production generate low yields and give rise to high production costs, with a price tied to the oil price. The global market for rubber was assessed as c $35bn in 2010 and the demand for natural and synthetic rubber was expected to have hit 27.7m tonnes in 2014. Du Pont and Goodyear have jointly produced a prototype tyre using biosynthetic isoprene. We estimate the size of the isoprene market to be c $2bn pa and growing at 3% pa, although isoprene is not Deinove's major target in this area.

In September 2014 Deinove signed a three-year collaboration agreement with Sofiproteol (now known as Avril), the French agri-food group, to develop new animal nutrition products. According to a 2014 report by Allied Market Research, the global animal feed additives market was valued at $14.9bn in 2013 and is estimated to reach $20bn by 2020, achieving a CAGR of 4.2% for the period 2013-20, boosted by a rising global demand for meat. Deinove, in collaboration with Avril, will seek to develop products that optimise health and nutrition. We understand that the project is progressing well and has already identified a number of strains of bacteria suitable for further testing. As the next step, Deinove, in partnership with Avril, and drawing on the animal husbandry expertise of the agri-foods business, will begin the process of testing the foodstuff additives on animals. Deinove believes that if the tests prove successful, commercial deployment of its products could take place in a little over two years (we assume sales from 2018).

Deinobioitics

In 2009 Deinove launched the Deinobiotics programme, which is seeking to develop, from the Deinococcus bacterium, antibiotics able to fight infections that have developed resistance to the current range of available antibiotics. Having identified 12 strains of Deinococcus exhibiting antibiotic behaviour, in March 2013 Deinove established a dedicated company, Deinobiotics, to which it contributed the intellectual property rights associated with its research on antibiotics and the transfer of research funding. Deinove retains 49% of the new entity with the other major shareholder, Holding Incubator Green Chemistry (51%). With the research funding and the €0.5m invested by Holding Incubator Green Chemistry it is expected that financial resources will be sufficient to finance the business until the first drug candidate has been identified (in January 2014 Deinobiotics put in place convertible bonds). Deinove retains the right to buy back, at a predetermined but undisclosed price, all the shares sold to Holding Incubator Green Chemistry. The business remains in the research and development stage, with preclinical trials unlikely to commence in the short term and no licensing revenue expected before 2018 at the earliest. We continue to assign no value to this business in our DCF valuation of the company.

THANAPLAST

In November 2012 Deinove announced its participation in a collaborative project, known as THANAPLAST, a €22m (€9.6m funding from OSEO) five-year programme of research and development aimed at improving the life cycle of plastics. The THANAPLAST project includes a number of partners including Carbios, a green chemistry company, two other industrial partners, Barbier Group and Limagrain, and a number of academic institutions. At the launch of the programme Deinove announced that it had taken a 2.45% share of the start-up capital of Carbios (holding now 2.01%) and warrants that may allow it to triple its shareholding. Carbios listed on the Alternext exchange in December 2013 and at a share price of c €13 is capitalised at c €59m. Deinove's holding is worth c €1.2m at current levels. In November 2014 Carbios announced that it had been successful in achieving 90% depolymerisation of a commercial plastic into poly-lactic acid (used in a variety of applications including decomposable packaging and medical implants) in 48 hours using an enzymatic process. The following month Carbios stated that it had completed Phase 2 of the THANAPLAST project enabling it to receive further funding under the terms of the agreement with OSEO. Given Carbios is at the research stage, the business remains loss making, but with net cash of €11.1m as at 31 December 2014 it believes it has sufficient financial resources to fund its activities until the end of 2017. We do not assume any revenue from the THANAPLAST project in our modelling of the company, nor do we include any value related to Carbios.

FY14 results

In FY14 Deinove recorded a net loss of €6.5m compared to a loss of €3.4m in FY13. The c €3m increase resulted from an expanded cost base, reflecting a move to larger premises and additional headcount, a less favourable tax position and a non-recurring item of €0.7m, mainly relating to the aborted secondary offering (July 2014). The net cash position (as defined by Deinove) of €2.2m at 31 December 2014 was subsequently boosted by the recent drawdown of the first tranche of the equity funding arrangement put in place with Kepler Cheuvreux (raising €2.2m in the first two months of 2015). By the end of February the net cash position had improved to €4.1m. In part due to the first milestone payment from the Deinochem project (€1m received February 2015) but also thanks to revenue generated from providing research services to its industrial partners and R&D tax credits, will allow Deinove finance its business during 2015. The company estimates that it has sufficient financial resources to fund its current programmes beyond Q316.

Financing

At the end of 2014 Deinove announced that it had reached a funding agreement with Kepler Cheuvreux for the provision of new equity up to a maximum of €15m payable in four instalments over a period of three years. Each instalment guarantees Deinove a fixed payment during a specified period, although details of the timing of each instalment were not disclosed. However, it was revealed that the first payment tranche was implemented at the same time as the signing of the contract with Kepler (December 2014) and that Deinove expects to receive a corresponding €3.5m within seven months of that date. Kepler's subscription price is fixed at a maximum discount of 7.5% to the prevailing Deinove share price. Although the arrangement with Kepler provides Deinove with the facility to raise up to €15m it is not required to fully utilise the facility. With a monthly cash burn of c €0.8m the facility, along with contributions from partners, should ensure that Deinove has sufficient funding to last until 2016. The new arrangement provides a valuable supply of funds, but will not discourage Deinove from seeking alternative sources of funding.

Management

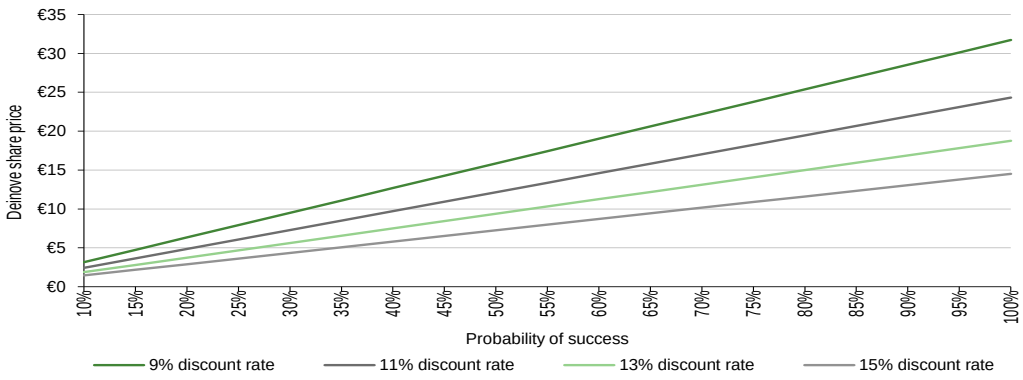
Emmanuel Petiot has led the executive committee of Deinove since joining the company at the beginning of 2013. Before Deinove he worked a director of sales at Novozymes. The management board consists of seven and is headed by Dr Philippe Pouletty, co-founder of the company. A scientific advisory board of 14 provides further academic guidance.

Valuation and sensitivities

Given that Deinove remains at a pre-commercial revenue stage, we continue to believe that a cash flow analysis remains the most appropriate method for providing valuation benchmarks. The analysis remains highly dependent on the assumptions used. We list our principal assumptions below.

- We assume that both Deinol and Deinochem are successful in generating commercial revenue.
- We include no revenue from Deinobiotics or THANAPLAST, nor do we ascribe any value to Deinove's holding in Carbios.
- Deinol: we assume that the technology is deployed in six average-sized ethanol plants by 2025 and a further six by 2035 (compared to 15 by 2035 previously). Based on our assumption of the market growth, this would give Deinove c 7% of assumed second-generation global ethanol by 2035.
- Deinochem: we expect commercial revenue from 2017/18 from the isoprenoid project. We assume revenue from the animal feed (carotenoid) project from 2018. In both markets we expect Deinove's partners to ultimately gain market shares of c 5% and for Deinove to receive 5% of partner revenues in royalty payments. Our previous forecast did not include any revenues from the carotenoid market.

Exhibit 3: Deinove DCF using a variety of discount rates and probabilities of success



Source: Edison Investment Research

Our DCF analysis indicates that at a price of c €8/share and using a discount rate of 11%, the market is assuming a c 35% probability of success. Applying a 15% discount rate to the same cash flows indicates that the market is assuming a c 60% possibility of success. As Deinove moves closer to commercialising its technology and the market can begin to assume the magnitude of the cash flows with greater certainty, we would expect a progressive decline in the discount rate used.

Of course there are a number of risks and sensitivities to our forecasts. The principal risk remains that the technology is insufficiently robust or price competitive for commercial deployment. Other risks include: that the timing of commercialisation falls behind the expected timetable; the incentive

programmes, eg for biofuels, are abolished or made less generous; and a permanently lower oil price undermines the economic justification for replacing oil-based products.

Comparable companies

There are only a small number of pure bioenergy/chemicals companies focusing on the same markets as Deinove and a number of them are either subsidiaries of larger entities or privately held. For example Allylix, a company that develops terpene products and their derivatives for a wide range of markets including flavour, fragrance and biofuel markets, and which was recently acquired by Evolva in an all share transaction for c $59m. In many cases there is relatively limited information available. In the table below we list those companies we consider broadly comparable to Deinove in business mix and scale and which are publicly quoted. Inevitably, this is a subjective list and one that is likely to vary as companies either succeed or exit specific areas.

Exhibit 4: Comparable company universe

Company	Country	Currency	Market cap (m)	Sales (historic)	Sales FY1 (m)	Sales FY2 (m)	EV/Sales (historic) (x)	EV/Sales FY1 (x)	EV/Sales FY2 (x)
Deinove	France	€	44	0.2	0.2	0.4	271.2	201.4	116.5
Amyris	US	$	179	43.3	95.0	165.0	8.5	3.9	2.2
Global Bioenergies	France	€	97	N/A	2.0	6.6	N/A	46.7	13.9
Metabolix	US	$	99	2.8	N/A	N/A	28.3	N/A	N/A
Gevo	US	$	51	28.3	40.1	N/A	3.0	2.1	N/A
Solazyme	US	$	272	60.4	71.1	170.8	4.9	4.2	1.8
Aemetis	US	$	93	N/A	N/A	N/A	N/A	N/A	N/A
BioAmber	US	$	185	1.5	11.5	56.3	127.0	12.0	3.5
Metabolic Explorer	France	€	110	3.7	3.5	4.8	N/A	29.7	21.9

Source: Edison Investment Research. Note: Prices as at 7 May 2015.

Financials

Our forecasts for FY15 and FY16 remain unchanged from those published in our update note published on 1 April 2015. We set out our principal assumptions below:

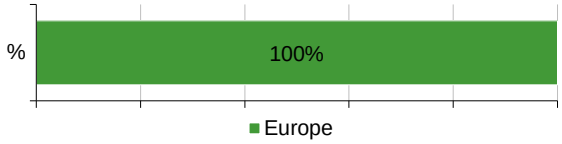
- Revenue: the timing of revenue receipts remains highly uncertain. For FY15 and FY16 we assume only payments for research services (c €220k of revenue).
- Costs: we forecast SG&A costs of c €8.5m in 2015, rising by inflation thereafter.
- Capex: we expect that capex, in the absence of a major new project, will remain flat at c €0.6m per year.
- Financing: to reflect the funding arrangement with Kepler we assume that Deinove issues c. 2.1m shares at a price of c €7/share to raise the full €15m permissible under the agreement. We assume that in total Deinove raises €6.3m from this source in 2015, with the remainder flowing through in 2016 and 2017. For the purposes of our forecast we no longer assume that Deinove raises money from a traditional equity issue.

Exhibit 5: Financial summary

€'000s	2013	2014	2015e	2016e
Year end 31 December	IFRS	IFRS	IFRS	IFRS
PROFIT & LOSS				
Revenue	51	156	220	225
Cost of sales	0	0	0	0
Gross profit	51	156	220	225
EBITDA	(5,156)	(6,515)	(7,467)	(7,567)
Operating profit (before amort. and except.)	(5,156)	(6,520)	(8,253)	(8,504)
Intangible Amortisation	367	540	26	26
Exceptionals	21	(735)	0	0
Other	0	0	0	1
Operating profit	(4,768)	(6,715)	(8,227)	(8,477)
Net Interest	122	(37)	(81)	(49)
Profit before tax (norm)	(5,034)	(6,557)	(8,335)	(8,553)
Profit before tax (FRS 3)	(5,380)	(7,832)	(8,361)	(8,579)
Tax	1,960	1,374	2,148	2,191
Profit after tax (norm.)	(3,074)	(5,183)	(6,186)	(6,362)
Profit after tax (FRS 3)	(3,420)	(6,458)	(6,213)	(6,388)
Average number of shares outstanding (m)	5.0	5.3	5.9	6.8
EPS - normalised (c)	(61.5)	(98.6)	(104.7)	(93.4)
EPS - (IFRS) (c)	(53.7)	(102.3)	(104.2)	(93.0)
Dividend per share (c)	0.0	0.0	0.0	0.0
Gross margin (%)	100.0	100.0	N/A	N/A
EBITDA margin (%)	N/A	N/A	N/A	N/A
Operating margin (before GW and except.) (%)	N/A	N/A	N/A	N/A
BALANCE SHEET				
Fixed assets	2,833	2,303	2,093	1,730
Intangible assets	85	99	73	47
Tangible assets	609	1,407	1,221	884
Investments	2,139	797	799	799
Current assets	4,129	4,650	5,188	7,463
Stocks	0	0	0	0
Debtors	2,188	2,110	1,665	1,775
Cash	1,872	966	1,949	4,114
Other	69	1,574	1,574	1,574
Current liabilities	(1,303)	(2,203)	(1,441)	(1,441)
Creditors	(1,238)	(1,441)	(1,441)	(1,441)
Short-term borrowings	(65)	(762)	0	0
Long-term liabilities	(3,057)	(4,554)	(5,556)	(7,556)
Long-term borrowings	(3,057)	(4,550)	(5,550)	(7,550)
Other long-term liabilities	0	(4)	(6)	(6)
Net Assets	2,602	196	284	195
CASH FLOW				
Operating cash flow	(5,499)	(8,453)	(7,022)	(7,677)
Net Interest	122	(37)	(81)	(49)
Tax	1,960	1,374	2,148	2,191
Capex	(375)	(1,338)	(600)	(600)
Acquisitions/disposals	3,779	1,307	0	0
Financing	768	4,051	6,300	6,300
Dividends	0	0	0	0
Net cash flow	755	(3,096)	745	165
Opening net debt/(cash)	2,005	1,250	4,346	3,601
HP finance leases initiated	0	0	0	0
Other	0	0	0	0
Closing net debt/(cash)	1,250	4,346	3,601	3,436

Source: Edison Investment Research

EDISON

Contact details	Revenue by geography
CAP SIGMA, ZAC Euromédecine II 1682 rue de la Valsière 34790 GRABELS France +33 (0)4 48 19 01 00 www.deinove.com	

CAGR metrics		Profitability metrics		Balance sheet metrics		Sensitivities evaluation	
EPS 12-16e	N/A	ROCE 15e	N/A	Gearing 15e	N/A	Litigation/regulatory	○
EPS 14-16e	N/A	Avg ROCE 12-16e	N/A	Interest cover 15e	N/A	Pensions	○
EBITDA 12-16e	N/A	ROE 15e	N/A	CA/CL 15e	3.6x	Currency	○
EBITDA 14-16e	N/A	Gross margin 15e	N/A	Stock days 15e	N/A	Stock overhang	●
Sales 12-16e	N/A	Operating margin 15e	N/A	Debtor days 15e	N/A	Interest rates	○
Sales 14-16e	N/A	Gr mgn / Op mgn 15e	N/A	Creditor days 15e	N/A	Oil/commodity prices	●

Management team

Chairman: Dr Philippe Pouletty

Dr Pouletty is co-founder of Deinove and is also founder of Truffle Capital, which remains the largest single shareholder in Deinove. Dr Pouletty is recognised as the inventor of 29 patents. He is the founder of three biotech companies in France and the US and sits on the board of 12 biotechnology companies.

CEO: Emmanuel Petiot

Before joining Deinove as CEO at the beginning of 2013, Emmanuel Petiot was commercial director of Novozymes North America. He spent nine years (2004-12) at Novozymes and held a number of executive positions in marketing sales and development of industrial partnerships in Europe, the US and Asia. Before Novozymes, Mr Petiot worked in sales and marketing roles at Air Liquide and Dow Chemical.

Director of Finance & Administration: Julien Coste

Julien Coste has experience of working for large corporate and smaller start-up companies. Mr Coste was director of finance and administration at biotechnology company Neuro3d and held the same position at Publicis Healthcare Communications Group. He holds Masters degrees from ESC Grenoble and the University of Paris Dauphine.

Principal shareholders	(%)
Truffle Capital	51.18
18Tereos International	2.17

Companies named in this report

Abengoa, Aemetis, Afex, Amyris, Avril BioAmber, Carbios, Du Pont, Gevo, Goodyear, Global Bioenergies, Metabolic Explorer, Metabolix, POET, Solazyme, Suez Environnement

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