BRYAN, GARNIER & CO

INDEPENDENT RESEARCH

2nd December 2016

TMT

Soitec

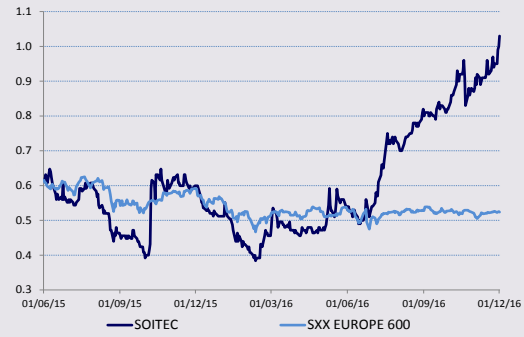
FD-SOI: forbidden fruit of the industry and market

Fair Value EUR1.25 vs. EUR0.50 (price EUR1.0) **BUY vs. NEUTRAL**

Bloomberg	SOI FP
Reuters	SOIT.PA
12-month High / Low (EUR)	1.0 / 0.4
Market capitalisation (EURm)	606
Enterprise Value (BG estimates EURm)	620
Avg. 6m daily volume ('000 shares)	1,683
Free Float	56.5%
3y EPS CAGR	NM
Gearing (03/16)	NM
Dividend yields (03/17e)	NM

YE March	03/16	03/17e	03/18e	03/19e
Revenue (EURm)	233.21	238.91	303.31	428.00
EBITA EURm)	22.4	21.7	35.8	62.5
Op.Margin (%)	9.6	9.1	11.8	14.6
Diluted EPS (EUR)	-0.01	0.02	0.04	0.07
EV/Sales	3.32x	2.59x	1.99x	1.32x
EV/EBITDA	21.3x	17.2x	10.1x	5.4x
EV/EBITA	34.6x	28.6x	16.9x	9.0x
P/E	NS	45.9x	25.7x	14.0x
ROCE	292.8	10.6	16.7	28.6

Price and data as at close of 31st November



This study aims to review the entire Soitec investment case. While the company suffers from a complex history, the arrival of a new management team in 2015 and the work carried out since have clearly renewed the group's profile. Many investors are still very reticent at the idea of revisiting the Soitec share. However, we are convinced that the time is now right to have a closer look. We believe that current valuation levels offer an opportunity to take positions in order to benefit in full from the take-off of FD-SOI and are adopting a Buy recommendation with a Fair Value at EUR1.25.

- **A new profile but FD-SOI remains key.** Now that Soitec has cleaned out the costly solar and lighting activities and is strengthened financially by the two capital increases, we believe an investment opportunity is taking shape with the start-up in FD-SOI sales, which would enable the group to change dimension.

- **Proof that FD-SOI is taking-off is accumulating.** Although FD-SOI has always been viewed as a promising technology, an ingredient was missing from the cocktail that could drive sales and remove the investment case from the speculative category. So far, we were not prepared to validate this scenario. However, we believe the recent introduction of 12FDX by GlobalFoundries provides the key factor for a genuine take-off in the technology. We have updated our model to include these changes in the backdrop. It now shows average growth in sales of 22% over the next three years and operating leverage enabling average annual growth of 43% in the group's EBITDA.

- **Currently valued on a pessimistic scenario.** Our work on scenarios for the development and valuation of FD-SOI, now leads us to consider that the share offers an attractive risk/reward profile. The current valuation reflects a pessimistic scenario whereas the targets of the incentive plan would value Soitec at EUR1.59 or upside potential of 60%. Our base case suggests upside of 25%. In this context of a gradual improvement in the group's profile and attractive valuation, we are adopting a Buy recommendation on the share.

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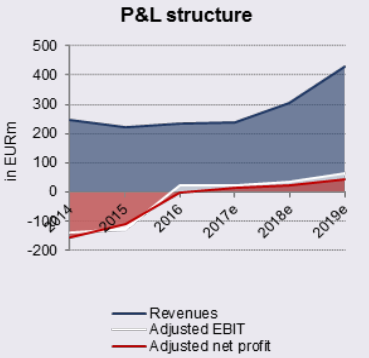

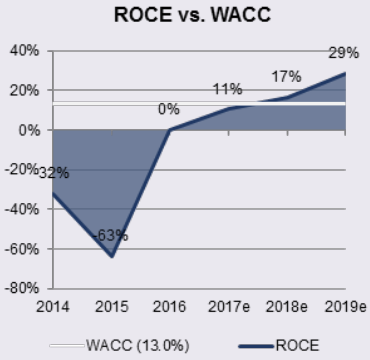

Company description

Created in 1992 and listed on Euronext Paris since 1999, Soitec is specialised in high-performance semi-conductors materials. The company has proprietary technologies for production of Silicon on Insulator wafers destined for the semiconductors market. Soitec is now the global leader in SOI silicon on insulator wafers. Recently, the group has massively strengthened its balance sheet via two capital increases raising a total amount of EUR150m. Soitec's aim is now to ensure the success of its new product FD-SOI.

Simplified Profit & Loss Account (EURm)	31/03/14	31/03/15	31/03/16	31/03/17e	31/03/18e	31/03/19e	31/03/20e
Revenues	247	223	233	239	303	428	550
Change (%)	*-6.0%*	*-9.8%*	*4.6%*	*2.4%*	*27.0%*	*41.1%*	*28.6%*
Adjusted EBITDA	*-27,4*	*-32,9*	*36,3*	*36,0*	*60,1*	*105,3*	*135,9*
Depreciation & amortisation	110	93.0	13.9	14.3	24.3	42.8	46.8
Adjusted EBIT	(137)	(126)	22.4	21.7	35.8	62.5	89.1
EBIT	(137)	(126)	22.4	21.7	35.8	62.5	89.1
Change (%)	*11.6%*	*-8.3%*	*-118%*	*-3.0%*	*65.0%*	*74.6%*	*42.7%*
Financial results	(16.7)	19.7	(22.5)	(6.0)	(7.6)	(10.7)	(13.8)
Pre-Tax profits	(155)	(108)	(0.37)	15.7	28.2	51.8	75.4
Tax	(0.06)	(0.22)	(3.5)	(2.5)	(4.6)	(8.6)	(12.6)
Net profit	(154)	(108)	(3.9)	13.2	23.6	43.2	62.7
Restated net profit	(154)	(108)	(3.9)	13.2	23.6	43.2	62.7
Change (%)	*13.8%*	*-30.2%*	*-96.4%*	*-441%*	*78.5%*	*83.0%*	*45.4%*
Cash Flow Statement (EURm)							
Operating cash flows	(200)	66.7	(12.5)	26.8	39.9	70.6	94.4
Change in working capital	(99.8)	67.9	40.8	(0.70)	(8.0)	(15.4)	(15.1)
Capex, net	(36.9)	(8.4)	(8.1)	(23.9)	(24.3)	(30.0)	(45.0)
Financial investments, net	(35.7)	(19.7)	34.6	0.0	0.0	0.0	0.0
Dividends	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Issuance of shares	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Issuance of debt	131	(78.7)	43.4	(111)	0.0	0.0	0.0
Other	(4.1)	101	(76.3)	263	0.0	0.0	0.0
Net debt	210	149	168	13.6	(2.1)	(42.6)	(92.0)
Free Cash flow	(237)	58.3	(20.5)	3.0	15.6	40.6	49.4
Balance Sheet (€m)							
Tangible fixed assets	281	157	121	130	130	117	116
Intangibles assets & goodwill	35.1	11.1	3.8	3.8	3.8	3.8	3.8
Investments	0.0	0.0	8.9	8.9	8.9	8.9	8.9
Current assets	134	132	80.0	81.0	92.2	114	135
Cash & equivalents	46.8	24.2	50.5	94.4	110	151	200
Total assets	585	394	325	380	416	482	567
Shareholders' equity	221	50.0	(7.1)	158	182	225	287
Deferred tax liabilities	18.4	17.5	0.0	0.0	0.0	0.0	0.0
L & ST Debt	257	173	219	108	108	108	108
Current liabilities	88.9	153	113	114	126	149	171
Total Liabilities	585	394	325	380	416	482	567
Capital employed	431	199	161	172	180	182	195
Ratios							
Operating margin	(55.55)	(56.47)	9.59	9.08	11.80	14.60	16.20
Tax rate	(0.04)	(0.20)	(936)	15.92	16.40	16.67	16.77
Net margin	(62.44)	(48.36)	(1.66)	5.53	7.78	10.08	11.40
ROE (after tax)	(69.96)	(216)	54.48	8.36	12.99	19.20	21.82
ROCE (after tax)	(31.89)	(63.46)	293	10.63	16.67	28.59	37.96
Gearing	95.28	298	(2,369)	8.58	(1.14)	(18.97)	(32.02)
Pay out ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of shares, diluted	211	211	419	606	606	606	606
Data per Share (EUR)							
EPS	(1.13)	(1.24)	(0.17)	0.02	0.03	0.06	0.08
Restated EPS	(0.73)	(0.51)	(0.01)	0.02	0.04	0.07	0.10
% change	*-19.5%*	*-30.2%*	*-98.2%*	*-336%*	*78.5%*	*83.0%*	*45.4%*
BVPS	1.04	0.24	(0.02)	0.26	0.30	0.37	0.47
Operating cash flows	(0.95)	0.32	(0.03)	0.04	0.07	0.12	0.16
FCF	(1.12)	0.28	(0.05)	0.00	0.03	0.07	0.08
Net dividend	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Company Data; Bryan, Garnier & Co ests.

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1. Investment Case

Why the interest now?

The reason for writing now

While the company suffers from a **complex history**, the arrival of a **new management team** in 2015 and the work carried out since have clearly renewed the group's profile. Today an **investment opportunity is taking shape with the take-off in FD-SOI sales**. So far, we were not prepared to validate a rapid growth scenario in FD-SOI sales, but we now believe that **the recent introduction of 12FDX by GlobalFoundries provides the key factor for a genuine take-off and success of the technology.** Following our work on valuation scenarios and the development of FD-SOI, we consider the share has an **attractive risk/reward profile**.

Cheap or Expensive?

Valuation

Our Fair Value of EUR1.25 stems from a DCF valuation (WACC of 13.0%) in our base case. We have also drawn up a bear case and a bull case, which value the share at EUR0.94 and EUR1.59 respectively.

When will I start making money?

Catalysts

Soitec is reaching a key point. We believe the take-off in FD-SOI, the group's latest technology, is imminent. **Forthcoming announcements of new products developed in FD-SOI should provide additional proof of this positive momentum.** In addition, growth in the group's 300mm sales would materialise in a lift of margin levels.

What's the value added?

Difference from consensus

At present, **the consensus is forecasting a slower development of FD-SOI than our central scenario**, estimating average growth over three years at 19.4% whereas our FY16/FY19e CAGR stands at 22.4%. Given our higher forecasts for volumes, our margin improvement estimates are also more optimistic at 14.6% for FY19e vs. 14.4% for the consensus.

Could I lose money?

Risks to our investment case

In order to significantly improve margins, the development of FD-SOI is a pre-requisite for Soitec. As such, **a slower-than-expected adoption of the technology could have a negative impact on our estimates.** In addition, note that Soitec is not the only player to produce FD-SOI wafers and **the strengthening of the competition** on this technology could also slow Soitec's development. Finally, keep in mind that **Soitec is currently the object of a complaint in the US**, the outcome of which is uncertain.

We are adopting a Buy recommendation

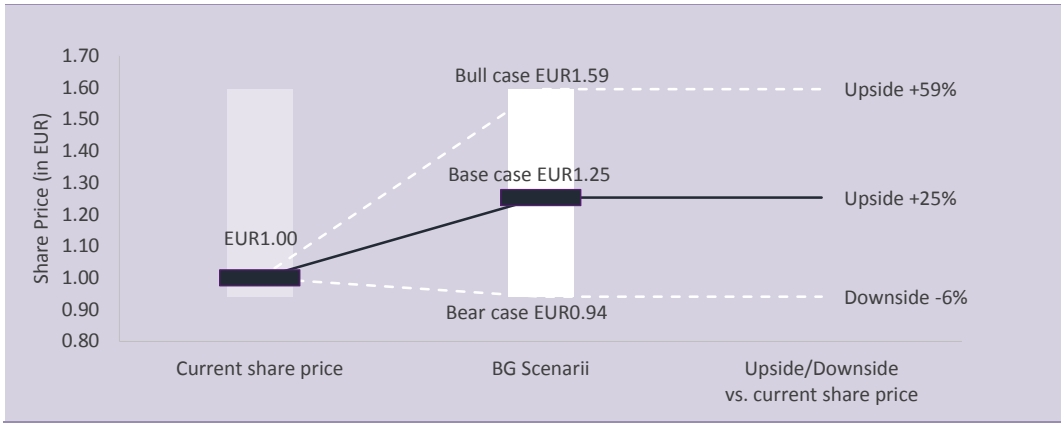
Soitec suffers from a complex history in both execution and stockmarket terms. However, the arrival of the new management team in 2015 and the work carried out since, has clearly turned around the group's profile. Soitec has now rid itself of the costly solar and lighting activities, while the two successive capital increases have helped significantly improve its balance sheet. **Today, an investment opportunity is therefore taking shape in the form of the ramp-up in FD-SOI sales, which would enable the group to change dimension.**

For more than three years, proof of an imminent take-off in the group's technology has been rising steadily. While FD-SOI has always been viewed as a promising technology, the cocktail was still missing the right ingredient to drive sales and get the investment case out of the speculative category. Until now, we were not prepared to validate this scenario. **However, we now believe that the introduction by GlobalFoundries of 22FDX and above all of 12FDX more recently, provides a key factor for the genuine take-off and success of the technology,** namely a future for FD-SOI and visibility beyond the 22nm.

Many investors are still very reticent about reopening the Soitec case. However, we are convinced that the time is now right to take a much closer look. Our work on creating scenarios for the development and valuation of FD-SOI prompts us to consider that the share harbours an attractive risk/reward profile. Our base scenario points to upside potential of 25% whereas the share is trading close to a pessimistic scenario and delivery of management's incentive plan could value Soitec at EUR1.59, pointing to upside of 60%.

In view of 1/ an improvement in newsflow concerning FD-SOI, 2/ the group's significantly improved profile, and 3/ a valuation showing upside potential of 25%, we are adopting a Buy recommendation. We believe that current valuation levels offer an opportunity to take positions in order to benefit in full from the take-off in FD-SOI.

Fig. 1: Bear/base/bull cases, an attractive risk/reward profile



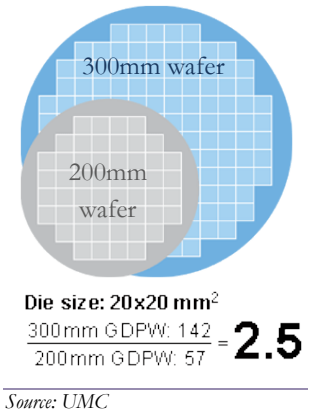
Source: Company Data; Bryan, Garnier & Co ests.

2. Tangible market opportunities

Before going into more detail, note that Soitec currently markets **five main categories of silicon wafers:** 1/ **RF-SOI**, for Radio Frequency Silicon On Insulator, destined for production of radio components associated to 3G/4G chips for smartphones, 2/ **Power-SOI**, destined for production of power components (capable of managing intense electrical currents feeding electric engines for example) for the automotive sector or industrial applications, 3/ **PD-SOI**, for Partly Depleted Silicon On Insulator, which is the group's historical technology and which is still used for production of certain computer processors, 4/ specialties wafers including Imager SOI and Photonics SOI, and 4/ **FD-SOI**, for Fully Depleted Silicon On Insulator, which is a development on PD-SOI and which also targets production of digital electronic chips for the mass market. Soitec does not undertake all of the wafer production, just the transformation of traditional wafers (bought from partner and shareholder Shin-Etsu) into SOI. **These wafers sold by Soitec are therefore more expensive** (around 4-5x more expensive than traditional wafers), **but they offer numerous advantages in terms of ease of production, reliability of the chips, energy efficiency and calculation power.** Soitec's customers are primarily founders and integrated device manufacturers (IDMs).

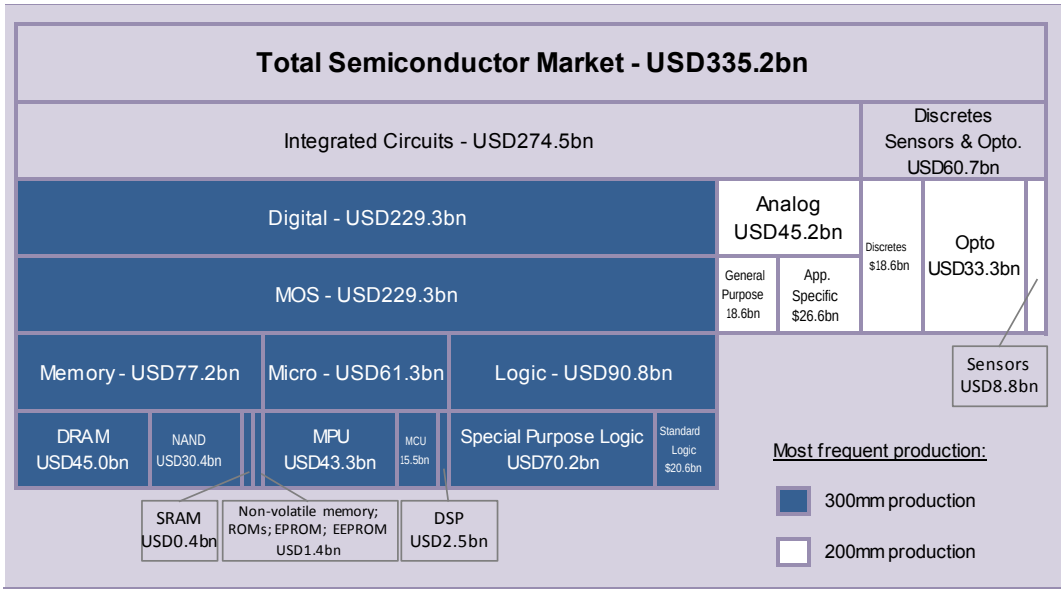
Production of **RF chips and power semi-conductor components** generally involves **silicon wafers of 200mm** in diameter whereas **digital electronic chips are produced on 300mm wafers.** Production on 300m wafers is more costly, but helps multiply by 2.5x the number of chips produced.

200mm vs. 300mm: a production multiplied by 2.5x



Source: UMC

Fig. 2: Wafer size commonly used by component type



Sources: WSTS; Bryan, Garnier & Co. ests.

Soitec produces 200mm wafers at Bernin 1, 300mm wafers are produced at Bernin 2.

Soitec sometimes categorises its RF-SOI and Power-SOI wafers under the joint appellation of 200m and PD-SOI and FD-SOI under the 300mm appellation. At Soitec, **200mm** wafers (RF-SOI and Power-SOI) are produced at the **Bernin 1** plant and the **300mm** wafers (PD-SOI and FD-SOI) at the **Bernin 2 plant**. Finally, note importantly, that the RF chips are starting to be produced on 300mm wafers, which is why some of the Bernin 2 plant is already reserved for production of RF-SOI 300mm wafers.

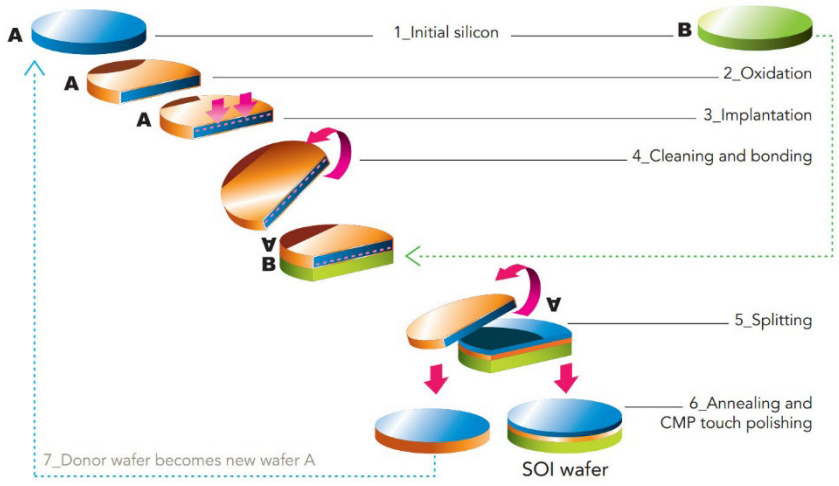
2.1. Demand for 200mm wafers is not slowing

Almost 100% of smartphones currently sold in the world embed SOI chips.

At present, virtually all RF chips used in smartphones (2G/3G/4G etc.) are produced by using RF-SOI 200mm wafers. In other words, **almost 100% of smartphones currently sold in the world embed SOI chips.**

Soitec has developed a technology enabling production of SOI wafers, known as SmartCut, and which has a market share that we estimate at more than 60% in RF-SOI wafers. Other players capable of producing RF-SOI wafers are Japanese group Shin Etsu and US group SunEdison, acquired in July 2016 by GlobalWafers. Note however, that Shin Etsu, the world no. 1 in wafer production all categories combined, is an historical shareholder in Soitec, despite owning less than 1% of the capital.

Fig. 3: Overview of production stages for a SOI wafer: Soitec SmartCut



Source: Soitec

2.1.1. 200mm production running at full capacity at Soitec

RF-SOI substrates are used in RF since their better stability and lower sensitivity to interferences

RF-SOI substrates are used in RF since their better stability and lower sensitivity to interferences makes them the perfect base for production of switches and filters, which are key elements for RF systems. Mobile-Experts estimated the market for RF chips for smartphones at around USD11bn in 2015. Translated into wafers, global demand for RF-SOI totals around 850,000 200mm wafers a year. We estimate that Soitec has sold around 530,000 RF-SOI wafers a year (or market share of more than 60%) in FY16. On the basis of a selling price of USD260 per wafer, or around EUR230, **200mm RF-SOI represents almost 55% of the group's sales** (FY16).

We estimate that 200mm RF-SOI represents almost 55% of the group's sales (FY16)

In view of the other technologies currently available and the advantages associated with the use of RF-SOI during production of RF chips, we believe the interest in using these wafers is sufficiently high for the substrate to remain the main support for the next five years. Indeed, RF chips, which use the RF-SOI/CMOS technology duo, have a facilitated integration with the rest of the components thanks to the CMOS construction whereas the SOI substrate provides greater flexibility and above all better management of the various frequencies used by the 2G, 3G and 4G networks throughout the world, in addition to boasting better resistance to interference. The other substrates that are currently capable of supporting the multiplication of frequencies are based on III-V materials (using one or several elements in columns III and V of the Mendeleev periodic table), but RF-SOI has the advantage of lower cost and facilitated integration.

In 200mm and beyond RF-SOI wafers, Soitec also markets wafers for production of Power-SOI, power semi-conductor components.

In 200mm and beyond RF-SOI wafers, Soitec also markets wafers for production of Power-SOI, power semi-conductor components. Power semi-conductors are components used primarily in automotive and industrial applications, destined to control electric flows in order to control an electric engine for example. Among the power components that can be built using the Power SOI substrate, are IGBT (Insulated Gate Bipolar Transistor) and MOSFET (Metal Oxyde Semiconductor Field Effect Transistor) as well as more developed products such as IPM (Intelligent Power Module). Together, these three components represent a market of more than USD11bn (or around 3.5% of global semi-conductor sales). A power semi-conductor component built using SOI is more efficient and more resistant. For example, these components are widely preferred in the automotive sector where restrictions are high and reliability is closely observed. At Soitec, we estimate that production of **Power-SOI wafers totals around 195,000 units a year, or around 20% of the group's total sales in the last fiscal year** based on a unit price of USD260 or c. EUR230. On the basis of total demand of 350,000 Power-SOI wafers a year, Soitec's market share stands at around 55% in this segment.

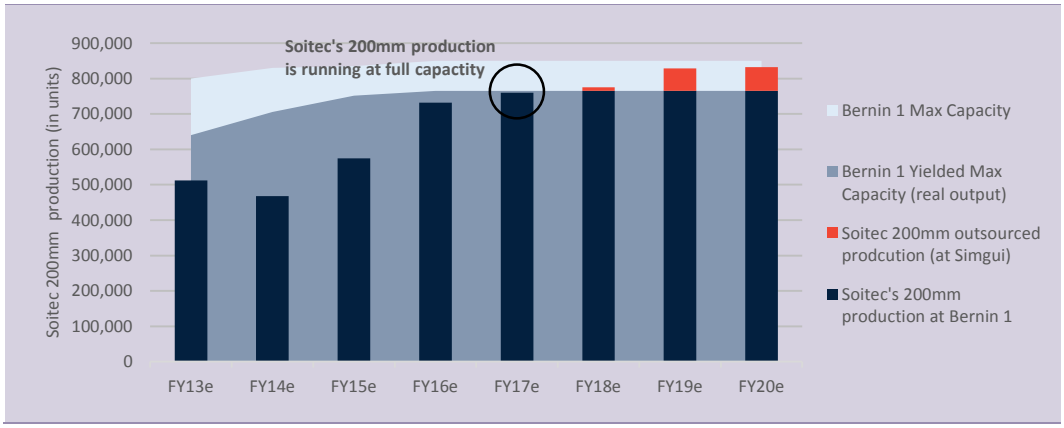
We estimate that 200mm Power SOI represents about 20% of the group's sales (FY16)

We believe that the SOI 200mm wafers destined for RF chips and power semi-conductors should grow in coming years given the rising demand and complex nature of these types of component, while Soitec's current production capacity is close to saturation.

Adding together the 535,000 RF-SOI wafers a year and the 195,000 Power-SOI wafers, Soitec's production totals 730,000 200mm SOI wafers, or around 86% of the group's total 200mm capacity. Indeed, the group produces all of the 200mm wafers at the Bernin 1 plant, which has maximum production capacity of 850,000 wafers a year. However, we have applied a 90% yield to this maximum production capacity with the remaining 10% corresponding to production halts, especially for maintenance work and production defaults that cause waste. As such, we estimate that the group's real production totals 765,000 SOI 200mm wafers. **Current production of 200mm wafers is therefore very close to the group's maximum capacity and Soitec's room to manoeuvre is limited concerning this internal production.**

Current production of 200mm wafers is therefore very close to the group's maximum capacity and Soitec's room to manoeuvre is limited concerning this internal production.

Fig. 4: Need to outsource some of the 200mm wafer production to make up for capacity limit problems at Bernin 1



Sources: Bryan, Garnier & Co. ests.

2.1.2. Simgui and 300mm taking over from RF-SOI

The group has two options to increase its sales of RF-SOI wafers: Chinese partner Simgui and RF-SOI 300mm wafer production.

With the Bernin 1 plant running at full capacity for Soitec, **the group has two options to increase its sales of RF-SOI wafers: Chinese partner Simgui and RF-SOI 300mm wafer production.**

The group's Chinese partner Simgui has as agreement to produce 200mm SOI wafers in China since September 2015. Simgui production unit has just completed the qualification stage, but no volumes are produced for the moment. According to the agreement, some of this production will be destined for the local market, while the rest will serve as additional capacity for Soitec. In other words, Soitec can now outsource some of its 200mm production to Simgui.

Simgui's theoretical production capacity of 150,000 RF-SOI wafers a year can therefore be shared between these two markets that should be considered differently:

- **Some of this production will be allocated to the Chinese market.** Out of this production, Soitec will not book revenues from sales of 200mm SOI wafers, but is set to book royalty revenues. We estimate these revenues at around 5% or around USD13 per wafer sold directly by Simgui to Chinese players).

- **The other share of production is destined for the rest of the world.** Here, Simgui has a traditional outsourcer role. In this configuration, wafer sales are therefore booked as revenues. On these wafers, the margin generated should be close to that on internal products, namely a gross margin of more than 30%.

300mm RF chips production is rolling out, as such there is a rising demand for 300mm RF-SOI wafers. The group can rapidly put in place RF-SOI 300mm wafer production by re-using currently unused PD-SOI tools at Bernin 2.

Outsourced production at Simgui is not the only means of benefiting from the constantly increasing opportunity of RF-SOI. Indeed, manufacturers of RF chips including Qualcomm, Broadcom, Qorvo, Skyworks, and Murata are working on rolling out 300mm production. This should lead **to rising demand for 300mm RF-SOI wafers**, even if these initiatives remain limited for the moment and we have no knowledge of high-volume production of RF-300mm. However, for Soitec, this is a genuine opportunity to seize since **the group can rapidly put in place RF-SOI 300mm wafer production by re-using currently unused PD-SOI tools at Bernin 2** (with no major changes and investment). At Soitec, this production was officially launched in February 2016, but does not yet generate sales, and should also be integrated into 300mm sales and not 200mm sales.

2.1.3. 200mm - quantifying the opportunity for Soitec

In order to estimate Soitec's sales, we have taken account of its production capacity to which we have integrated a notion of yield (as we already mentioned, 100% of the wafers produced are not sold).

At USD260 per wafer, maximum sales of 200mm wafers (RF and Power) are therefore slightly more than EUR175m.

As such, for the 200mm wafers produced at Bernin 1, the group's total theoretical capacity stands at 850,000 wafers a year. We have applied a yield of 90% for this plant, or 765,000 wafers eligible for sales each year, before the take-off in Simgui sales volumes. **At USD260 per wafer, maximum sales of 200mm wafers (RF and Power) are therefore slightly more than EUR175m** (with a EUR/USD exchange rate of 1.10 or c. EUR180m at 1.06). Note that Soitec's 200mm sales stood at EUR170.5m in FY16 (average EUR/USD exchange rate of 1.10) and management regularly points out that its 200mm capacity is fully exploited today.

We estimate that global supply of 200mm wafers is now slightly strained given the low number of manufacturers (Soitec, which has market share of around 62%, GlobalWafer with SunEdison, and Shin Etsu) and rising needs (increase in size of RF chips for smartphones, new POWER SOI applications in the auto industry etc.). This prompts us to expect stable prices in 200mm wafers in our FY17e/FY20e estimates.

For Soitec, growth in 200mm sales can therefore only be driven by the ramp-up at Simgui.

For Soitec, growth in 200mm sales can therefore only be driven by the ramp-up at Simgui. Given the current state of production at Simgui (qualification only just complete), we have assumed zero capacity for FY17e, 30,000 wafers for FY18e and 75,000 wafers for FY19e and FY20e, or 50% of the total capacity targeted by Simgui bearing in mind that we estimate that the other half will be used by Simgui for its direct sales in the Chinese market (see Section 2.1.2).

Fig. 5: Detailed FY16/FY20e 200m volume and sales estimates

	FY16	FY17e	FY18e	FY19e	FY20e
200mm wafer price (in USD)	260	260	260	260	260
EUR/USD average exchange rate	1.10	1.11	1.06	1.06	1.06
200mm wafer price (in EUR)	233	234	245	245	245
Bernin 1					
Total production capacity	850,000	850,000	850,000	850,000	850,000
Production Yield	90%	90%	90%	90%	90%
Maximum output	765,000	765,000	765,000	765,000	765,000
Bernin 1 output	732,000	760,000	765,000	765,000	765,000
Utilisation rate	96%	99%	100%	100%	100%
Bernin 1 - revenue (in EURm)	**170.5**	**178.1**	**187.6**	**187.6**	**187.6**
Simgui					
Total production capacity	0	0	30,000	75,000	75,000
Production Yield	85%	85%	85%	85%	90%
Maximum output	0	0	25,500	63,750	67,500
Simgui output	0	0	10,000	63,750	67,500
Utilisation rate	0%	0%	39%	100%	100%
Simgui - revenue (in EURm)	**0.0**	**0.0**	**2.5**	**15.6**	**16.6**
Total 200mm revenue (in EURm)	**170.5**	**178.1**	**190.1**	**203.3**	**204.2**
Seq. growth	41%	4%	7%	7%	0%

Sources: Bryan, Garnier & Co. ests.

Note that, logically, the ramp-up in Simgui's production does not cause any particular investments for Soitec and there is no capex opposite this output.

2.2. FD-SOI, or the industry's forbidden fruit

The FD-SOI technology was presented several years ago now and although very promising, it has nevertheless yet to enjoy a genuine commercial take-off.

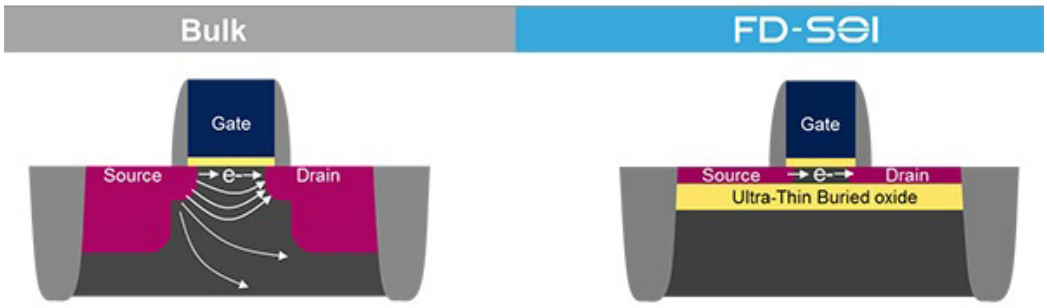
The FD-SOI technology was presented several years ago now and although very promising, it has nevertheless yet to enjoy a genuine commercial take-off. Firstly, timing was an issue since FD-SOI was presented as an alternative to the FinFET technology (a 3D transistor architecture developed primarily by Intel), when this emerged as the future for the semi-conductors industry. Impressed by the performances obtained by Intel with 3D FinFET transistor structures, the entire industry allowed itself to be pulled into this costly yet promising adventure. This was above all the only path offering genuine long-term visibility, with FD-SOI then seen as a transition solution, helping to conserve 2D structures for just a few more years before being obliged to inevitably adopt 3D transistor structures.

In an industry where it is better to innovate rather than follow, the FinFET path therefore naturally looked more attractive. However, the slightest growth in smartphones and PCs, or the hype created by the Internet of Things and the automotive and industrial sectors, whose needs are more focused on energy performance and the reliability of calculation performance, undermines certain technological choices today. As such, those that continued their research into FD-SOI now find themselves in an advantageous position.

2.2.1. FD-SOI: why and for who?

FD-SOI (Fully Depleted Silicon On Insulator), was developed from another technology, PD-SOI (Partly Depleted). FD-SOI wafers stand out from bulk silicon wafers by the presence of two additional thin layers (or three layers in all).

Fig. 6: Cross section of a transistor on bulk wafer vs. FD-SOI



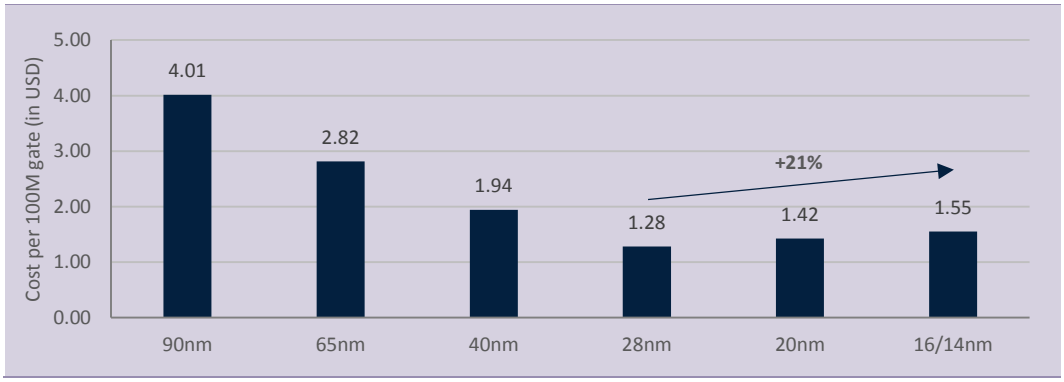
Sources: STMicroelectronics; Bryan, Garnier & Co ests.

An SOI wafer is around four/five times more expensive than a bulk wafer, but helps significantly improve the performance of the chips produced, however the higher price of the wafer is fully offset by the production gains generated elsewhere

An SOI wafer is around four/five times more expensive than a bulk wafer (between USD400 and USD500 vs. around USD100), **but helps significantly improve the performance of the chips produced** (power and reduction in energy consumption). The performance gains enabled by the use of SOI wafers means that it is possible to use old-generation production tools that are perfectly controlled and amortised, to produce chips with equivalent performances to those produced with the latest generation tools. As such, **the higher price of the wafer is fully offset by the production gains generated elsewhere** (higher yield, amortisation of production tools often reduced, lower cost of roll-out of production lines, significantly reduced time to market etc.).

However, **the introduction of 20nm** implies new **complex production techniques** (double patterning) and more sophisticated and **expensive production tools**. The industry is facing an issue of higher costs per transistor, in other words, the Moore law has been broken economically since the introduction of 20nm mid-2014.

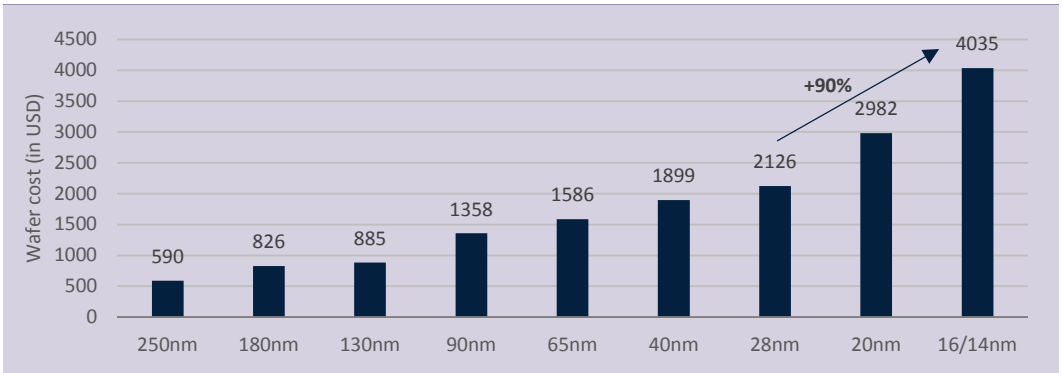
Fig. 7: Rising cost per transistor since the 20nm node



Sources: IBS; Bryan, Garnier & Co ests.

Per wafer post-production (namely after engraving of the chips), the impact of the switch to 16/14nm node was even more dramatic since between a wafer processed at 28nm and a wafer engraved at 16/14nm, the cost (post-production) is virtually double.

Fig. 8: Boom in costs per wafer (post-production)



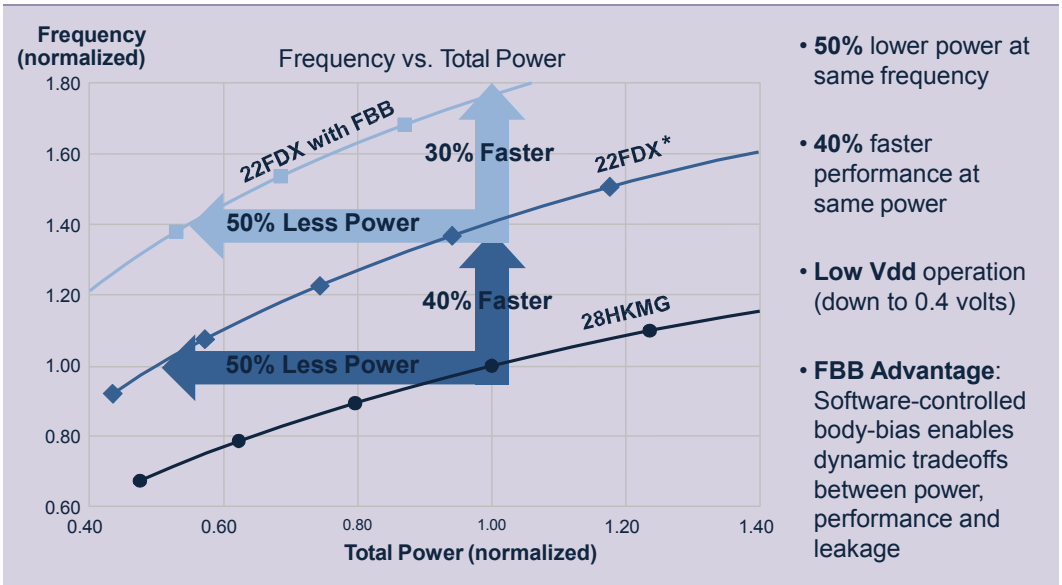
Sources: NXP; GlobalFoundries; IBS; Bryan, Garnier & Co ests.

In short, despite a price four/five times higher on purchase, FD-SOI wafers maintain an economic interest. Assuming that performances of a 28nm FD-SOI chip are similar to those of a 16/14nm, the cost of the FD-SOI wafer post production is 66% lower including the additional USD400 linked to the high purchase price of the wafer.

Another advantage of FD-SOI wafers is that they help dynamically control the chip's efficiency via the software.

Another advantage of FD-SOI wafers is that they help dynamically control the chip's efficiency via the software. This means it is possible to apply a temporary performance boost at the expense of energy consumption during execution of an intensive task, then restore the chip to an energy-saving state when it is resting. This is called body biasing, with forward body biasing (FBB) enabling an increase in performances and backward body-bias limiting energy consumption (sometimes also known as reverse back-bias (RBB).

Fig. 9: FD-SOI enables dynamic control (software) of computing power vs. energy consumption



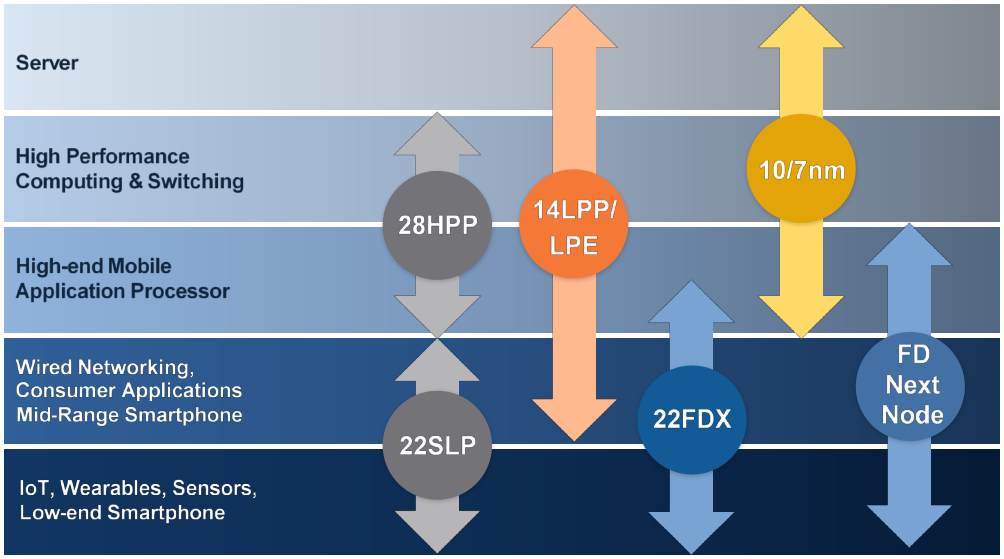
*Source: GlobalFoundries / *22FDX = 22nm FD-SOI chez GlobalFoundries*

These features enabled Sony to develop a GPS chip that only consumes one fourth of the energy of traditional GPS chips. This may seem insignificant as a development, but it nevertheless paves the way for new applications for GPS chips such as connected watches with permanent tracking while maintaining autonomy of more than 35h (see section 2.2.3.2).

Lower node (FinFET) nevertheless maintains the advantage of a higher absolute computing performance.

While FD-SOI chips are less expensive to produce and have a better flexibility (computing power vs. energy consumption), lower node (FinFET) nevertheless maintains the advantage of a higher absolute computing performance thereby making this production more adapted to applications that require high calculation power on a permanent basis (servers, PC, upscale smartphones, network equipment etc.).

Fig. 10: Destined above all for IoT (incl. Auto) and low to mid-range smartphones

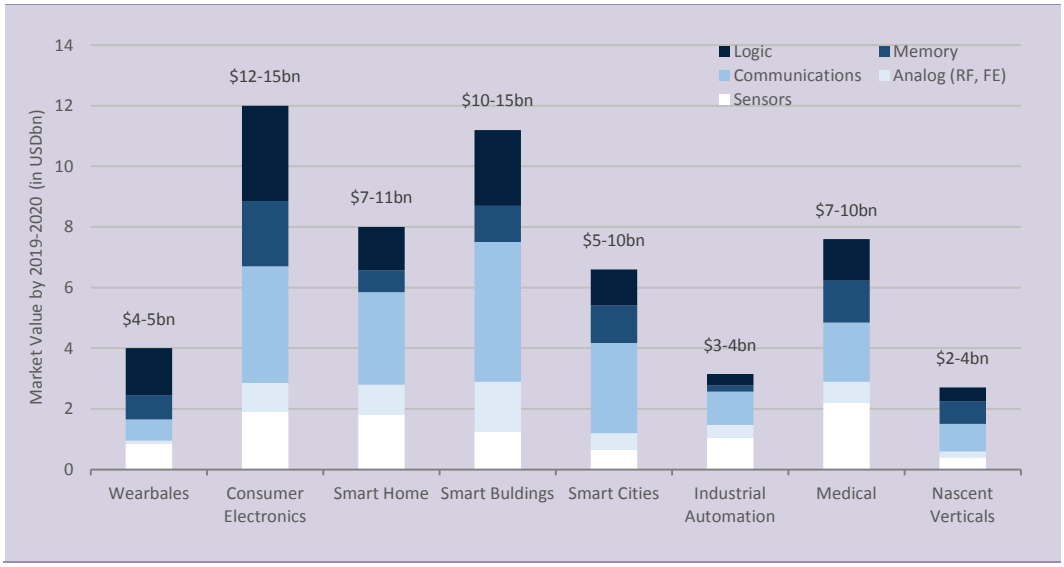


Source: GlobalFoundries

This is why FD-SOI wafers are not destined for production of high-performance digital circuits but rather digital chips destined for the Internet of Things.

This is why FD-SOI wafers are not destined for production of high-performance digital circuits but rather digital chips destined for the Internet of Things. For example, these substrates correspond perfectly to production of microcontrollers for the automotive segment (already undertaken by STMicroelectronics) or wearables. Despite these limits, the addressable market remains substantial. According to GlobalFoundries, it could reach USD50-75bn by 2020.

Fig. 11: An addressable market of USD50bn minimum



Sources: GlobalFoundries based on volume forecast by McKinsey, Gartner, IHS, Strategy Analystics

The automotive segment should not be underestimated either.

While the development of IoT can therefore be viewed as a catalyst for FD-SOI, **the automotive segment should not be underestimated either**. The development of connected vehicles and above all, autonomous vehicles, is an opportunity for numerous players, including NXP (currently being bought by Qualcomme), Infineon (Buy (FV EUR18.5) and STMicroelectronics (Neutral, FV EUR7.3). Among these three European names present in the Top 5 largest semi-conductor players specialised in automotive, two of them (ST and NXP) are very familiar with FD-SOI.

Developments in the automotive segment suggest that future vehicle models will contain ever more electronic equipment. Embedded chips will have to 1/ handle ever more information generated by sensors which are already multiplying rapidly in body parts, and 2/ activate ever more complex actions (emergency braking today, fully-autonomous driving tomorrow). As such, embedded calculation power will be a key component for tomorrow's vehicles in order to better manage image recognition and complex algorithms associated with artificial intelligence. However, one of the main characteristics of the automotive market is that it is particularly sensitive to prices, resistance (temperature, radiation etc.) and the reliability of components, three of the advantages of FD-SOI.

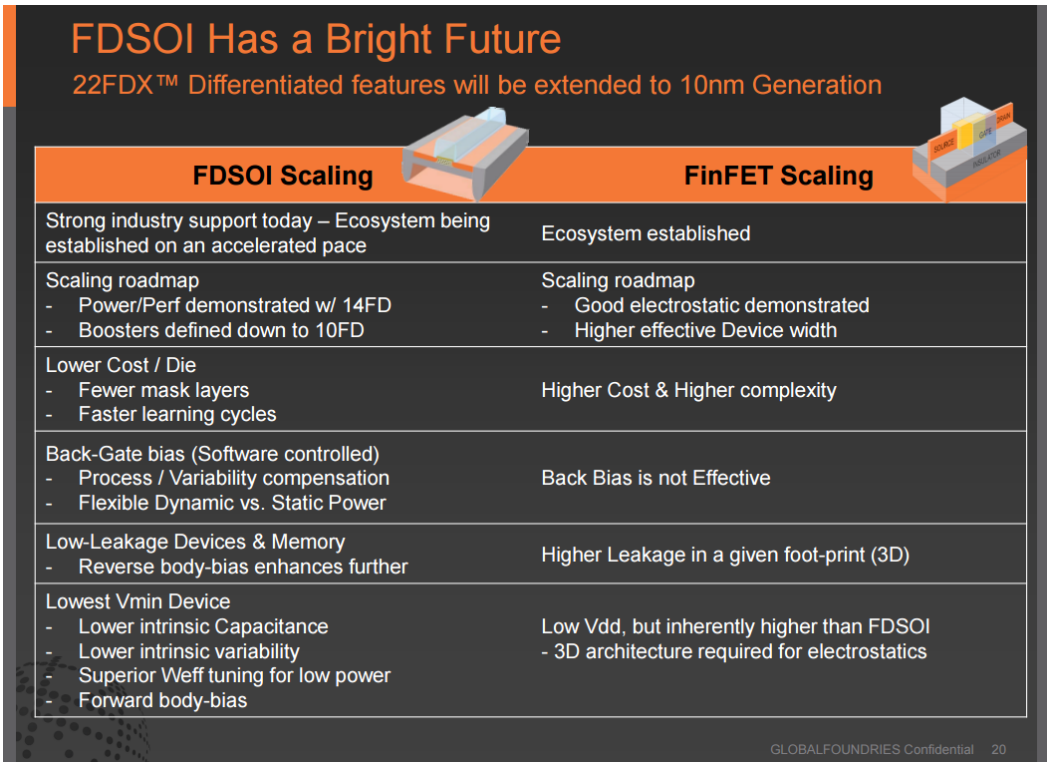
Thus, in our opinion, the main FD-SOI market remains the chips destined for IoT (USD50-75bn by 2020) and automotive (> USD35bn by 2020).

2.2.2. GlobalFoundries, the main promoter of the technology

During summer 2015, GlobalFoundries, second largest independent foundry, announced the launch of a new 22nm production line in FD-SOI, named 22FDX.

During summer 2015, GlobalFoundries, second largest independent foundry, announced the launch of a new 22nm production line in FD-SOI, named 22FDX. GlobalFoundries chose to allocate some of its Fab 1 in Dresden, Germany to FD-SOI. This giga-fab boasts capacity of around 960,000 wafers a year (80,000 wafers a month "wspm"). In all, GF has invested more than USD6bn in this fab, which is therefore strategic for the group and also shows the importance of the FD-SOI technology for the foundry.

Fig. 12: GlobalFoundries is a keen supporter of FD-SOI technology



Source: GlobalFoundries

Although the GlobalFoundries slide above shows the two technologies in perspective, note that the FinFET and FD-SOI technologies should not compete with each other. FinFET is destined for production of very large volumes and for high-performance circuits requiring the best density possible. The FDX/FD-SOI technology targets chips that function more on low energy, are smaller and have lower performances.

According to Gary Patton, CTO of GlobalFoundries, risk production in 22FDX is currently underway (end-2016) and volume manufacturing should start in 2017.

The foundry is currently targeting mainly RF and analogical circuits but Mr Patton reminded that a large share of digital chips is still produced by using aging manufacturing process of between 65nm and 28nm. The switch of production of these chips to FinFET (i.e. the production technology used at the moment for advanced digital chips such as computer chips and upscale smartphones) requires significant investment in time and money terms for semi-conductor players. GlobalFoundries sees an opportunity here.

In September 2016, the foundry updated its roadmap to include the 12FDX, which is an extension of 22FDX.

In September 2016, the foundry updated its roadmap to include the 12FDX, which is an extension of 22FDX. For this technology, we expect no mass production before 2019 (official press release: roll-out of production during H1 2019) or 2020. However, the strengthening of the FD-SOI roadmap is particularly important since it proves the interest of GF's customers for this technology. This point is also reflected in the figures provided by the foundry. Out of its 250 clients, 50 have already shown their interest in producing in FD-SOI.

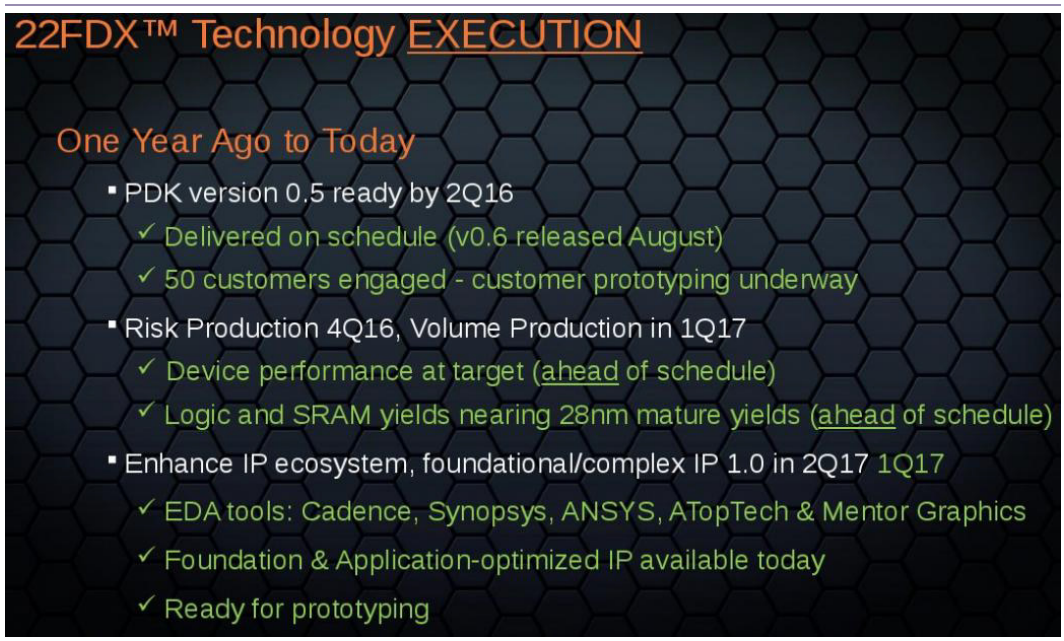
This production technology enables GF to produce better performing chips than in 14/16 FinFET (dethroned recently by the 10nm which is just going into mass production), which consumes almost 50% less energy (see Fig. 5) heats less, is more resistant to interference and which is cheaper. In addition, thanks to the forward body bias, performances can even exceed that of 10nm according to GlobalFoundries.

However, beyond performances, we believe there were two particularly important and reassuring points at the presentation of 12FDX:

- **Firstly, this new node offers genuine visibility and credibility for FD-SOI over the long term.** We have already explained that for a while, FD-SOI was viewed as transitory solution before the obligation to switch to a 3D transistor architecture, FinFET. Here, thanks to 12FDX, GlobalFoundries has finally shown interest in 22FDX and validated the viability of development of FD-SOI chips thanks to a long-term roadmap.

- **Secondly, the progress report on 22FDX provided on the same occasion was very positive since all of GF's objectives for FD-SOI were reached ahead of schedule.** This even enabled GF to gain time in the roll-out of the technology.

Fig. 13: GF: exemplary execution in the roll-out of FD-SOI



Source: GlobalFoundries

2.2.3. …but the foundry is not alone to support FD-SOI

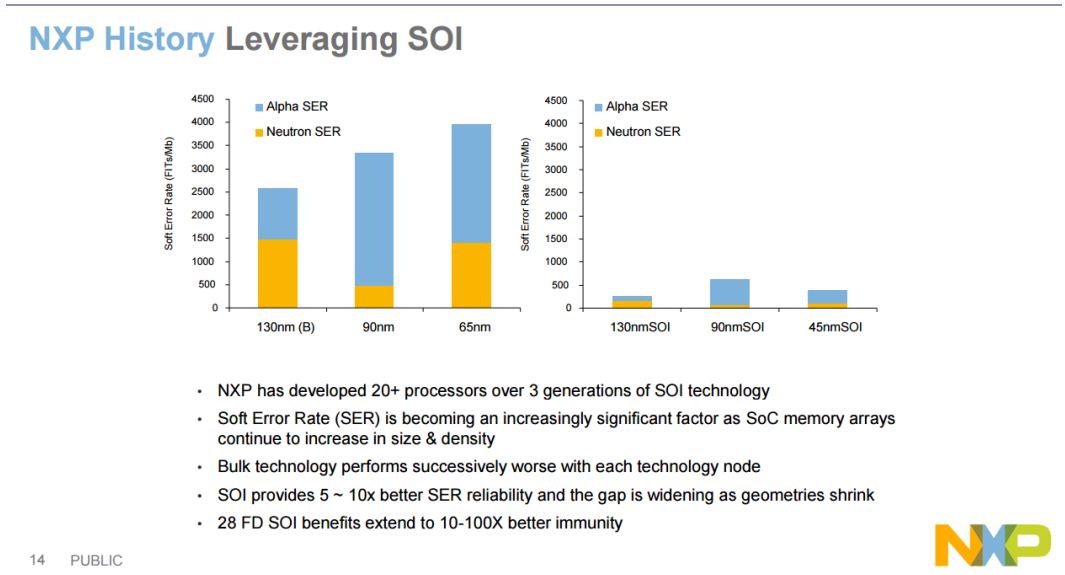
While GlobalFoundries and Soitec are often the main groups cited when it comes to FD-SOI, the ecosystem is not just limited to these two players.

2.2.3.1. NXP – currently the largest application

NXP group had acquired in-depth knowledge of the advantages of SOI substrates and this work was maintained as the main development path after the acquisition of Freescale.

NXP is currently one of the rare players to produce in FD-SOI. The Dutch group is primarily engaged in the FD-SOI adventure via the acquisition of Freescale. **The Netherland-based group had acquired in-depth knowledge of the advantages of SOI substrates and this work was maintained as the main development path after the acquisition.**

Fig. 14: NXP making the most of significant know-how in SOI



Source: NXP - i.MX 7/8 presentation at FD-SOI Symposium, San Jose, April 2016

Today, the application processors (AP) housed in the i.MX range at NXP benefit from this know-how. In 2016, these APs were produced using the FD-SOI 28nm technology developed by STMicroelectronics (Neutral, FV EUR7.3) and transferred during a partnership to Samsung, which therefore handles manufacturing of NXP's chips today. Given their still-limited adoption primarily in the automotive segment and eBook readers, volumes remain low (200m i.MX SoC sold since 2001, or 13m units per year on average), but the range of processors is nevertheless a leader in vehicle infotainment with more than 35m cars equipped since 2007. In addition, the new i.MX7 (for embedded systems, eBook readers, medical, wearables, and IoT) and i.MX8 (for automotive) approach the market differently, which could help these APs to stand out from the competition. This differentiation stems primarily from their very low energy consumption thanks to the use of FD-SOI.

Engineers we spoke to at NXP view FD-SOI as the most appropriate solution to meet their challenges:

- **Reduced energy consumption and flexibility in performance:** the construction of FD-SOI makes the chips more economic on an equivalent performance basis, while forward body-bias (see section 2.2.1) provides unique flexibility that is much appreciated in certain environments, especially automotive where a permanent arbitrage takes place between temperature, performance and energy consumption.

- **Better insulation and hence better reliability of chips:** RF/analogical blocks are particularly sensitive to changes in voltage of digital blocks, thereby making the design of these chips complex and prompting a higher default rate for this type of chip. FD-SOI helps efficiently isolate the various blocks and avoid interference, which clearly simplifies the integration of Wifi and Bluetooth in System on Chip (SoC) for example.

- **A significantly lower error rate**: the smaller size of transistors automatically increases the soft error rate (SER), especially in terms of the SoC memory blocks. The FD-SOI geometry helps reduce SER by a factor of 10-100.

- **A simplified transition in intellectual property (IP) already developed and reduced time-to-market**: for its new generation microcontrollers, NXP generally re-uses 80% of the IP already developed for previous generations. By maintaining a 2D (planar) architecture, FD-SOI helps NXP rapidly adapt its IP with no extra costs.

We estimate that FD-SOI consumption for i.MX should exceed 62,000 300mm wafers over FY17e.

Based on the average dimensions of i.MX 7, namely an average die (piece of Silicon) of 182mm² (BGA 12x12mm to 19x19mm) and an average annual volume of 20m i.MX chips, **we estimate that FD-SOI consumption for i.MX should exceed 62,000 300mm wafers over FY17e.**

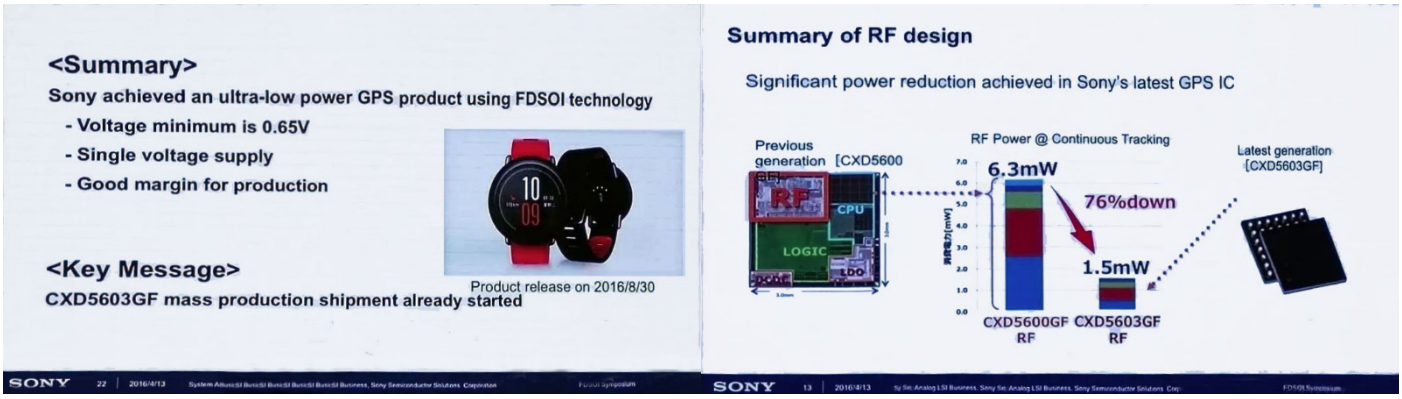
2.2.3.2. Sony – proving to the rest of the industry the interest of FD-SOI for mass market applications

Sony is far more discrete than GlobalFoundries, Soitec, STMicroelectronics and NXP when it comes to FD-SOI. However, the R&D pipeline of the Japanese giant seems very promising.

Sony's work on FD-SOI has been officialised through the launch of a new smartwatch that embeds a new GPS chip that is so energy-efficient

In October 2016, the launch of the new connected watch by Xiaomi, the Huami Amazfit, officialised **Sony's work on FD-SOI. This watch embeds a new GPS chip that is so energy-efficient** that even with the positioning option activated permanently, the SmartWatch maintains 30 hours of autonomy. Like NXP, Sony also uses Samsung's FD-SOI 28nm production capacity (inherited from a collaboration with STMicroelectronics) for its new range of GPS chips.

Fig. 15: The Sony GPS chip helps reduce energy consumption by 76%



Source: Sony at 2016 Shanghai FD-SOI Forum

For Soitec, this watch and its GPS chip represent almost nothing in terms of volumes.

For Soitec, this watch and its GPS chip represent almost nothing in terms of volumes. Even with (very) optimistic sales volumes estimates for the Amazfit, namely 10m units (or slightly less than the Apple Watch in 2015), this represents barely 1,200 wafers for Soitec since the GPS chip developed by Sony has the specific feature of being particularly small (>8mm²). However, what's important is above all the message that this announcement sends out. Here the potential of FD-SOI and its industrialisation is clearly underscored and its feasibility in mass consumer applications has been proven for the first time.

In addition, the specialised press has reported on Sony's work in more ambitious projects concerning FD-SOI, namely image sensors

In addition, the specialised press has reported on Sony's work in more ambitious projects concerning FD-SOI, namely image sensors, one of the pillars of Sony's business in which the group is the global leader (35% market share ahead of Samsung with 19%). Here, Sony is interested in FD-SOI primarily for the image processor (ISP) superposed on the image sensor (CIS). Thanks to the higher energy efficiency of FD-SOI, Sony can develop more efficient ISPs without impacting the sensor's performances due to the overheating of the ISP. Based on the size of a smartphone sensor of 20mm² on average, FD-SOI wafer consumption would stand at 3,000 for 10m units. For a camera sensor with an average size of 225mm², wafer consumption for production of 10m units rises to 37,000 wafers. Finally, note that Sony currently sells around 450m sensors a year, 90% of which are destined for mobile devices. On this basis and purely as an example, a first approximation points to consumption of 260,000 wafers a year if all of the Sony sensors are equipped with FD-SOI ISPs, or around 72% of capacity (after a yield rate of 90%) at Soitec's Bernin 2 plant.

2.2.3.3. China – a heavyweight supporter

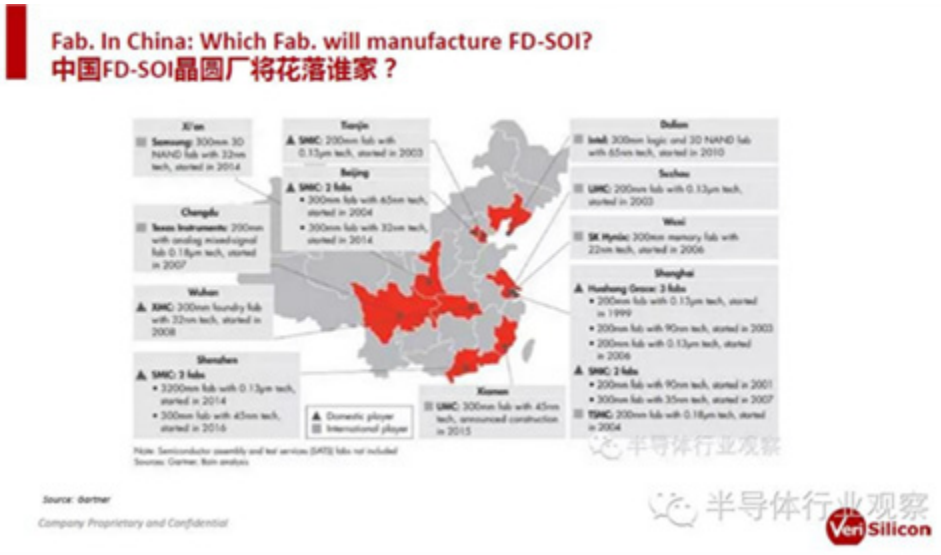
China is probably the region where the FD-SOI environment is the most robust. This stems from the fact that the country is the largest global consumer of electronic components and yet, there are only very few local players recognised internationally. This is also why the country has implemented a CNY1bn (USD160bn) plan to underpin development of the semiconductors industry. However, despite this massive clout, the local semiconductors industry is suffering from a two/three generation lag relative to the sector giants (TSMC, Samsung and Intel) that remains difficult to fill. For this reason, like GlobalFoundries, we believe that China has chosen to diversify and therefore to use FD-SOI.

Examples of China's backing for this technology are numerous, and among the recent ones is the message from Dr Xi Wang, CEO and member of the Chinese Academy of Sciences (a leading institution in China) and founder of the Shanghai Institute of Microsystem and Information Technology (SIMIT), as quoted in the official press release on the launch of 12FDX by GlobalFoundries: " We are very happy to discover GlobalFoundries' 12FDX technology and the advantages that this can deliver to Chinese clients. This extension of the FD-SOI roadmap should enable clients focused on the mobile, IoT and automotive sectors to obtain the best FDX technology in order to create competitive products".

However, it is important to note that NSIG, the Chinese investment fund which entered Soitec's capital during the reserved rights issue in May 2016 (14.5% of the capital)was created and financed by SIMIT. As such, in a communicating vases effect, Dr. Xi Wang currently has a seat on Soitec's Board of Directors.

At the same time, in the GlobalFoundries press release and alongside Dr. Xi Wang, Wayne Dai, CEO of VeriSilicon (a well-established chip design company located in Shanghai) stated he was also very satisfied with the foundry's extension of the FD-SOI roadmap. In this he sees an opportunity to make the most of the advantages of the technology for his clients active in the automotive, IoT, mobility and mass consumer segments.

Fig. 16: Verisilicon sees genuine potential for FD-SOI in China



Source: VeriSilicon at 2016 Shanghai FD-SOI Forum

FD-SOI therefore offers an attractive alternative for China. The technology could help the local industry stand out and catch up its delays relative to the US, Taiwan and Korea. In addition, it is also better suited in terms of financial markets than FinFET (IoT, mid-range smartphones, automotive). Indeed, it is not incongruous to imagine GF setting up in China in order to produce FD-SOI.

2.2.3.4. ARM – full support of FD-SOI

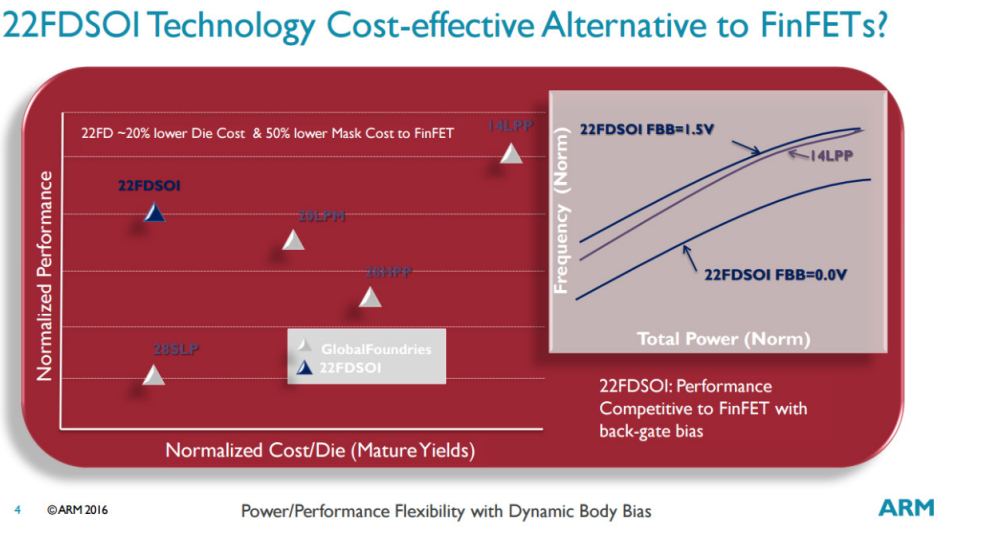
ARM unveiled its FD-SOI offer, especially the support for this technology by the ARM Artisan POP IP solution

A new supporter, and by no means a small one, ARM, which designs processors for smartphones and other mobile devices, was a guest at the SOI consortium in April 2016. The group made the most of this to present its vision of the SOI technology and **unveiled its FD-SOI offer, especially the support for this technology by the ARM Artisan POP IP solution**, which includes handling of the design and implementation of ARM Cortex processors and Mali graphic processors for third parties.

ARM therefore adds to a long list of FD-SOI supporters and also confirmed that its Cortex processors are more efficient and energy saving when produced in FD-SOI. The designer took the example of its Cortex-A72 which has similar performances if it is produced in FD-SOI 22nm or in FinFET 16/14nm, although thanks to the back-gate bias, FD-SOI enables the performance level and consumption level of the processor to be dynamically adjusted. As such, ARM also confirms that an efficient implementation of the reverse back-gate bias helps considerably improve the processor's energy efficiency. ARM therefore proposes widespread implementation of back-gate bias management available directly from its solution.

Fig. 17: ARM Cortex - Cost/performance differential of FD-SOI/FinFET

ARM therefore adds to a long list of FD-SOI supporters and also confirmed that its Cortex processors are more efficient and energy saving when produced in FD-SOI.



Source: ARM

ARM's neutrality lends considerable credibility to this data.

ARM's neutrality lends considerable credibility to this data. We also see it as a reflection of the technology's traction by its clients, a population that can be resumed in simple terms: virtually all semiconductor companies.

Finally, the availability of ARM Physical IP support of ARM FD-SOI processors should also help the industry to adopt the technology.

2.2.3.5. STMicroelectronics – but why has Mobileye chosen 10nm FinFET?

Although the FD-SOI ecosystem is strengthening rapidly, it remains to be seen why Mobileye, a current FD-SOI user via its joint-development programme with STMicroelectronics, is switching to 10nm FinFET for its fifth-generation chip EyeQ5 (mass marketing expected during 2020).

We believe this change in strategy is due exactly to the lack of visibility on the technology's evolution when decision has been taken.

We believe this change in strategy is due exactly to the lack of visibility on the technology's evolution when decision has been taken. If GF's 12FDX corrects this weakness, we believe that during initial discussions on future chip generations, the development of GF's roadmap was still uncertain. However, in view of the development of a generation of chips due to be mass marketed in 2020, the lack of visibility on the evolution of FD-SOI was a penalising factor.

Despite this, note that production of the fourth-generation of Mobileye chips, EyeQ4, is to start in 2017 and this is to be carried out in FD-SOI.

Despite this, note that production of the fourth-generation of Mobileye chips, EyeQ4, is to start in 2017 and this is to be carried out in FD-SOI. Thanks to the SOI substrate, STMicroelectronics and Mobileye managed to develop a chip with outstanding energy efficiency: 2.5 Teraflops for 3W. In comparison, the latest chips dedicated to massive information processing at Intel, the Knight Landing range, consumes 1W for 0.01 Teraflops.

Fig. 18: Audi zFAS system using Mobileye's EyeQ3

Source: WCCFTech

STMicroelectronics expects to manufacture 32-bit STM32/STM33 microcontrollers as well as the associated memory (eNVM) in FD-SOI very soon.

ST's consumption could rise to 30,000 wafers a year just for production of its MCUs.

In addition, use of FD-SOI at **STMicroelectronics** is unlikely to decrease once EyeQ5 production starts since the group **expects to manufacture 32-bit STM32/STM33 microcontrollers as well as the associated memory (eNVM) in FD-SOI very soon.** At present, these MCUs are primarily produced in 40nm, although Carlo Bozotti, CEO of the semiconductors manufacturer pointed out again in November 2016 that production of these MCUs would soon switch to 28nm FD-SOI. At STMicroelectronics, the MCU STM32 and STM33 ranges are currently a huge success. These ST microcontrollers represent a standard for the industry and notably enable the group to dilute growth in other digital activities, especially chips for Set-Top Boxes. Based on average volumes for STM32 estimates at 125m units (with a die size of 16mm² on average), **ST's consumption could rise to 30,000 wafers a year just for production of its MCUs**, bearing in mind that the group, via Marco Monti, VP of the ADG division (Automotive & Discrete Group), has already stated that he was also planning to produce a non-negligible part of the chips destined for the automotive segment including infotainment processors (a strong focus at ST), satellite signal receivers for radios, telematic chips and connectivity chips.

In November 2016, In an interview with EETimes, Marco Monti added:

" FD-SOI is not simply a technological node for ST, it is a comprehensive cluster of technologies (usable) for all types of automotive applications".

2.2.4. 300mm - quantifying the opportunity for Soitec

We believe that it is now timely to reassess production volumes for 300mm FD-SOI wafers in Soitec's sales estimates for coming years.

Given the various heavyweight players now officially showing their support for FD-SOI, the ecosystem put in place and the recent announcements concerning the marketing of FD-SOI chips, **we believe that it is now timely to reassess production volumes for 300mm FD-SOI wafers in Soitec's sales estimates for coming years.**

As for production of 200mm wafers, in the construction of our scenario, we take account of available capacity and the time and investments necessary to develop this capacity. We also validate our assumptions by an inverse modelisation resulting in a volume of product production likely to use low-energy consumption chips in order to assess the overall penetrate of FD-SOI (see Fig. 20).

Fig. 19: Our 300mm wafers sales scenario, from FY16 to FY20e

	FY16	FY17e	FY18e	FY19e	FY20e	Comments
300mm wafer price (in USD)	550	480	458	438	418	We apply a 7% decline per year on avg
EUR/USD average exchange rate	1.10	1.11	1.06	1.06	1.06	Based on current spot EUR/USD
300mm wafer price (in EUR)	497	449	432	413	394	Wafer cost under EUR400 by FY20e
FD-SOI - STMicroelectronics	8,000	12,480	39,000	39,000	39,000	MCU STM32/33 + eMVN - 25% of ST's Crolles 2 capacity by FY20e
FD-SOI - Samsung	17,600	45,000	50,000	65,000	65,000	Only considering NXP demand here
FD-SOI - GlobalFoundries	0	9,214	75,000	150,000	442,500	c. 50% of GF Fab 1 capacity by FY20e
FD-SOI wafers	25,600	66,925	164,000	254,000	546,500	Bernin 2 at full capacity by FY20e
RF-SOI 300mm wafers	0	500	30,000	180,000	220,000	Implying a 3% 2015/2020 CAGR of 3% on smartphones
Imager-SOI wafers	3,000	5,000	7,200	47,200	48,500	New applic. - image sensor opportunity
Photonics-SOI wafers	17,000	19,000	25,000	35,000	35,000	Intel for Server applications, capped by FY20e due to prod. limits
Legacy PD-SOI wafers	62,000	30,000	20,000	10,000	5,000	Expect strong and rapid decline (FY16/FY20e CAGR of -47%)
Total volume of 300mm wafers	**107,600**	**121,425**	**246,200**	**526,200**	**855,000**	
Bernin 2						
Total production capacity	720,000	750,000	750,000	750,000	750,000	
Production Yield	85%	85%	87%	90%	90%	
Maximum output	612,000	637,500	652,500	675,000	675,000	
Bernin 2 output	107,600	121,425	246,200	526,200	675,000	At full capacity by FY20e
Utilisation rate	18%	19%	38%	78%	100%	
Bernin 2 - revenue (in EURm)	**53.5**	**54.5**	**106.5**	**217.3**	**266.2**	
Singapore						Might also be a new fab in China
Total production capacity	0	0	0	100,000	225,000	
Production Yield	0%	0%	0%	60%	80%	
Maximum output	0	0	0	60,000	180,000	
Singapore output	0	0	0	0	178,300	
Utilisation rate	0%	0%	0%	0%	99%	
Singapore - revenue (in EURm)	**0.0**	**0.0**	**0.0**	**0.0**	**71.0**	
Total 300mm revenue (in EURm)	**53.6**	**54.5**	**106.5**	**217.3**	**337.2**	
Seq. growth	20%	2%	95%	104%	55%	

Sources: Bryan, Garnier & Co. ests.

A few additional details concerning the two main sources of volume for the Bernin 2 plant, the RF 300mm and FD-SOI:

- For FY20e, we have assumed 180,000 **RF-SOI 300mm** wafers. This implies average annual growth in smartphone volumes of 3% over the period and an average increase of around 14% in the complexity and hence, the size of the RF chips (for information, an iPhone 4 embedded 9mm² of SOI whereas the iPhone 7 uses 27mm² of SOI for its RF chips, or an average annual increase in the surface of SOI of 20%) and a slight increase in demand for 200mm, or no change in RF-SOI volumes at Soitec, but a market share falling from 62% in FY16e to 60% in FY20e. At Soitec, this production implies no significant investments since it is possible to use the tools dedicated so far to PD-SOI production for RF-SOI 300mm production.

- For FY20e, we are forecasting a volume of **FD-SOI** wafers of around 546,000. In concrete terms, this means **we expect FD-SOI chips to be present in one out of six connected objects** going into **2020**[1]. This vision of things seems to be coherent with the energy investments made so far to implement an FD-SOI ecosystem by the various industry players including GlobalFoundries, ARM, STMicroelectronics, NXP, Samsung and the leading Chinese groups. For Soitec, this production implies investment spending of around EUR40m in order to adapt PD-SOI tools installed at Bernin 2 for production of FD-SOI. The investment sequence that we estimate implies that the plant is capable of running at full capacity (or 400,000 FD-wafers a year) as of FY19e (used at 65% in our scenario), helped by a second fab then.

Fig. 20: Our detailed scenario by volume source for FD-SOI wafers in FY20e

Foundry	Product	Customer / chip ref.	Production Period	Annual chip volume ests. by FY20e	Die size	Annualized wafer consumption equivalent(1)
STMicroelectronics	MCU + eNVM	ST STM32/STM33	From 2017	125m	16mm²	30,873
STMicroelectronics	ADAS MPU	Mobileye EyeQ4	2017-2021	7.6m	42mm²	5,050
STMicroelectronics	ADAS Radar	ST STRADAxxx (undiscl. ref.)	From 2017	3.5m	65mm²	3,646
Samsung	GNSS Receiver	Sony CXD6503GF	From late 2016	10m	8mm²	1,221
Samsung	Auto + indust. MCU	NXP i.MX 7/i.MX 8	From late 2016	20m	182mm²	62,096
GlobalFoundries	ASSP/ASIC/MCU	Multiple (50 customers)	From mid-2017	90m	182mm²	278,774
GlobalFoundries	ASSP/ASIC/MCU	Multiple (50 customers)	From mid-2017	260m	42mm²	174,041
GlobalFoundries	ASSP/ASIC/MCU	Multiple (50 customers)	From mid-2017	280m	20mm²	87,246
Total FD-SOI wafer demand						**642,947**
Soitec Market share by FY20e						85%
Soitec – FD-SOI wafer demand by FY20e						**546,505**

(1)including 5% manufacturing waste / (2)(3)(4)average of 1.8/5.2/5.5m chips respectively per GF customer having already shown interest in FD-SOI

Sources: Company data (die size); Bryan, Garnier & Co ests.

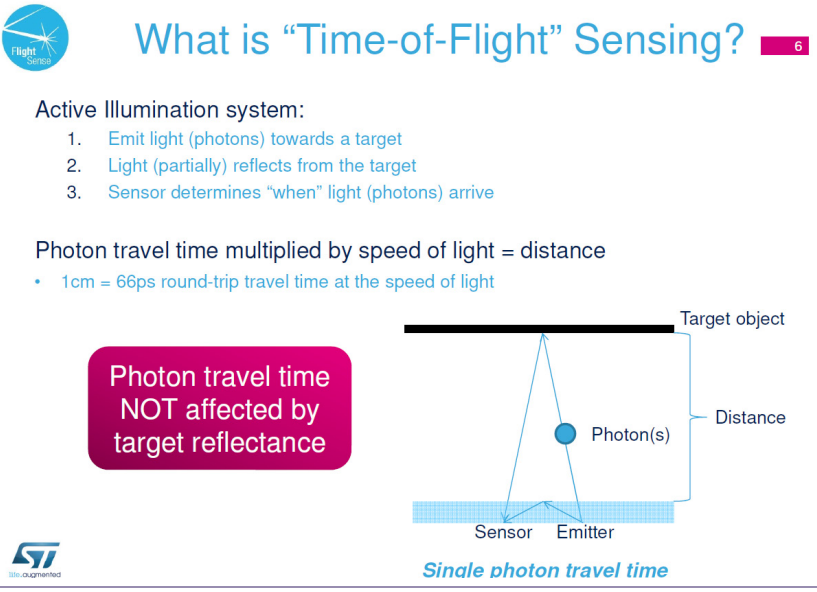
By 2020, i.e. one quarter of FY20 and three quarters of FY21, GF and Samsung's development plans move towards 1m and 0.5m wafers a year respectively, with eventually the option of a plant for GF in China.

[1] Gartner estimates: c. 4.4bn connected things to be produced by 2020e

2.2.5. Additional opportunities: Time-Of-Flight sensors

We see increasingly high traction for Time-Of-Flight type sensors. These components function as a lidar, namely they are made up of a laser (emitter) generating light pulsations (with a specific frequency and wave length) that are reflected by the objects making up the scene towards a sensor juxtaposed to the emitter. The time taken between emission and reception helps define the distance of objects making up the scene. At present, these sensors are used by certain upscale smartphones as proximity sensors in order to turn off the screen during a call for example.

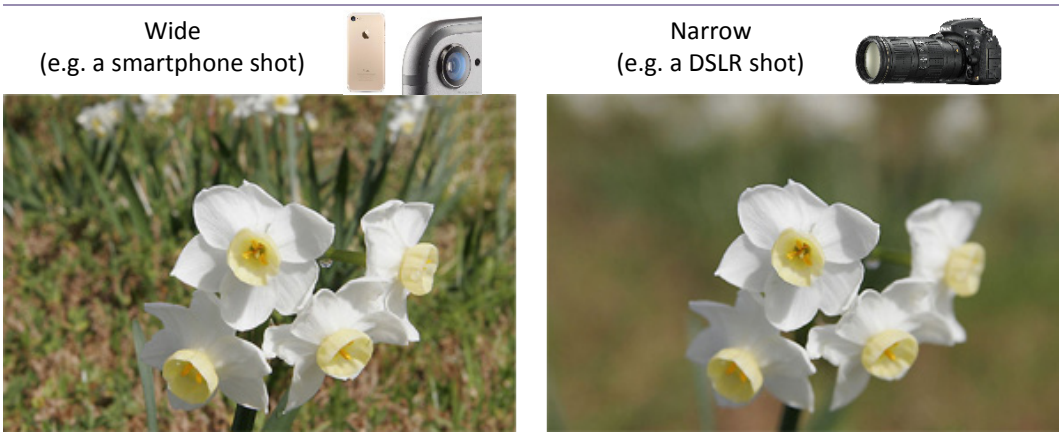
Fig. 21: Time of Flight (FlightSense by STMicroelectronics)



Source: STMicroelectronics

However, we believe that multiple applications exist for this sensor. The one that makes the most sense in the short term is use of the ToF technology to add a notion of depth of field to images generated by a smartphone photo sensor. Indeed, photo sensors often suffer from an association with very compact opticals, limit the reduction in the field depth in order to highlight a subject.

Fig. 22: Notion of field depth



Source: QImaging

Thanks to improved ToF sensors juxtaposed to the image sensors, smartphones could capture the various levels of depth in a shot. It would then be possible to apply precisely a blurred effect to the background while maintaining the subject perfectly in focus.

Fig. 23: Time of Flight –3D view of a scene

Source: Texas Instruments

In this backdrop of rapid development in the ToF sensors market, we believe that SOI wafers can play a significant role. Indeed, FD-SOI could help considerably improve the performances of ToF sensors, thereby making them 1/ compatible with a large field capture (vs. a few points at present, thereby helping to assess the distance but for which the precision does not help capture all of the depth levels of a scene), 2/ sufficiently small to be embedded in a smartphone, 3/ acceptable from a cost perspective by smartphone manufacturers (between USD6 and 9 per sensor). For example, on the basis of an average chip size of 20mm² (namely equivalent to the size of a smartphone photo sensor) consumption of FD-SOI wafers would stand at 3,000 for 10m units, and adoption of this technology in an iPhone model could generate consumption of 60,000 to 70,000 FD-SOI wafers a year.

2.3. Review of competitive backdrop

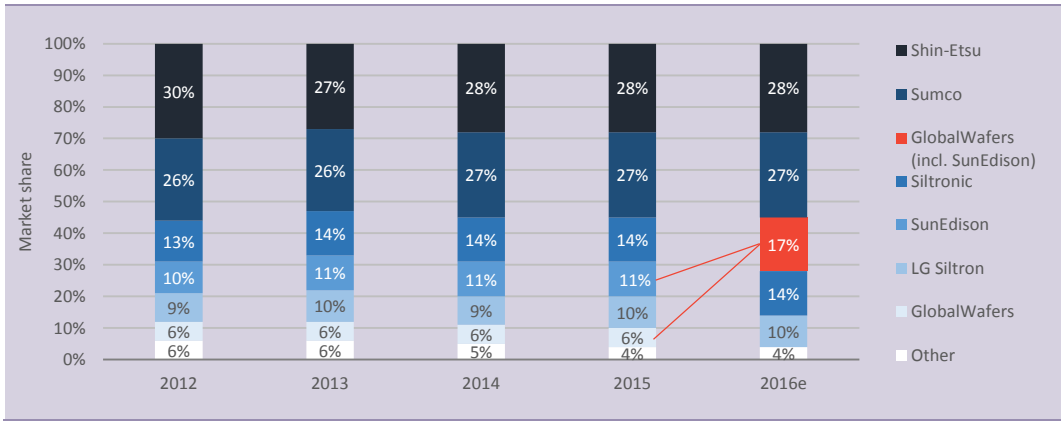
2.3.1. Market consolidation: SunEdison/GlobalWafers

2.3.1.1. Creation of a new heavyweight…

In August 2016, Taiwanese group GlobalWafers, then the no. 6 global wafers manufacturer, announced the acquisition of SunEdison Semiconductor. Together the two groups should take the no. 3 global position.

In August 2016, Taiwanese group GlobalWafers, then the no. 6 global wafers manufacturer, announced the acquisition of SunEdison Semiconductor for USD683m (c. EUR610m). This acquisition has just been validated by the US and Taiwanese authorities but has yet to be completed. **Together the two groups should take the no. 3 global position.**

Fig. 24: Market share in wafers market



Source: Gartner; Siltronic; Bryan, Garnier & Co ests.

SunEdison concluded a deal with the French group enabling SunEdison to have a licence to produce SOI wafers.

The fact that GlobalWafers, the no. 6 player in the market, can offer itself the no. 4 player, whose sales are virtually double the size of its own, exists because SunEdison is in receivership. The link with Soitec is that **SunEdison concluded a deal with the French group enabling SunEdison to have a licence to produce SOI wafers**. We estimate that the terms are similar to those of the agreement between Soitec and Simgui, namely around 5% of the wafer price in the form of royalties. We understand that GlobalWafers can hold onto this licence following the acquisition.

2.3.1.2. … but with limited means

For the moment, we are not aware of FD-SOI production at SunEdison. However, the risk exists that GlobalWafers develops this production when demand ramps-up, thereby increasing the risk of price pressure for Soitec. However, GlobalWafers has limited means to develop this production since at the end of Q3 2016, the net debt level at the Taiwanese group totalled USD60m (before payment of the acquisition of USD683m). Bearing in mind also that GlobalWafers is financing the acquisition with a loan that also limits its ability to invest in the development of new production capacity, a fact which also blocked Soitec before its refinancing. A rapid estimate suggests a **net debt/EBITDA multiple of 5.0x after consolidation.** It will also be difficult to dip into cash generation since GW generated stable FCF over FY13/FY14/FY15 of close to EUR30m with capex reaching around USD40m in FY15. Meanwhile, in FY15, SunEdison Semi generated negative FCF of USD30m.

Due to limited means, we believe that the risks of seeing the Taiwanese group compete with Soitec in FD-SOI before FY19 are limited.

While nothing prevents GlobalWafers from unblocking fresh financing sources, in the current state of affairs, we believe that the risks of seeing the Taiwanese group compete with Soitec in FD-SOI before FY19 are limited.

The last player that has the technology to manufacture FD-SOI wafers is Shin-Etsu. However, we consider this player as a partner to Soitec and not a genuine competitor. Indeed, note that the Japanese group is an historical shareholder in Soitec and that it is also its supplier of bulk wafers. Finally, in our base scenario, we have applied a decline of 5% a year, such that the price per FD-SOI wafer is close to USD420 in FY20e.

2.3.2. Patent-trolling, a story lasting since 1999

The Silicon Genesis affair returned to the limelight in October 2016 after SiGen had already accused Soitec in December 2015. The US group went to the US International Trade Commission (USITC) to try and halt imports of SOI wafers to the US. In May 2016, SiGen then voluntarily withdrew its complaint before even obtaining the USITC decision.

Note also that SiGen, which has been under Chapter 11 bankruptcy since 2015, does not actually produce SOI wafers, and seems to be aiming to obtain financial compensation from Soitec, or even royalties on SOI wafer sales.

In October, SiGen filed another complaint concerning the supposed counterfeit by Soitec of two US patents owned by SiGen, which were not among those targeted in the first complaint. Soitec is particularly confident it will not be found guilty of counterfeit, but this accusation remains a spanner in the works for the group and a risk for investors.

At present, we have no reason to think that things should take a turn for the worse for Soitec. Note also that **in 2002, the US District Court of Massachusetts ordered Silicon Genesis to pay USD3m in damages for counterfeiting to Soitec**, following a similar procedure initiated in 1999. While this precedent provides no information as to the outcome of the case underway, it does give an idea of the associated financial implications.

3. Our scenario: a clear improvement in the group's profile

3.1. We have assumed a gradual ramp-up in FD-SOI

Our scenario stems from the volume and sales assumptions set out in section 2. Since the group has now rid itself of its non-profitable businesses, namely solar and lighting, and that 200m wafer production is already saturated, estimates for margin levels are primarily correlated to growth in 300mm production.

We are forecasting constant growth in EBITDA margin over our time-frame

As such, **we are forecasting constant growth in EBITDA margin over our time-frame**, namely out to FY20e. At this date, we are forecasting EBITDA of EUR136m and adjusted EBIT of EUR89m, or **EBITDA growth of 39% over the period**.

Fig. 25: Sales up 24% over FY16/FY20e and significant operating leverage

[in EURm]	FY16	FY17e	FY18e	FY19e	FY20e	CAGR FY16/20e
200mm	171	179	190	203	204	
300mm	54	55	106	217	337	
Royalties	9	6	7	7	9	
Sales	**233**	**239**	**303**	**428**	**550**	**23.9%**
Seq. growth	5%	2%	27%	41%	29%	
Gross profit	**62**	**70**	**94**	**139**	**182**	
Gross margin	27%	29%	31%	33%	33%	
R&D	-8	-22	-27	-37	-47	
% of sales	-3%	-9%	-9%	-9%	-9%	
G&A	-22	-20	-24	-32	-37	
% of sales	-9%	-9%	-8%	-8%	-7%	
S&M	-10	-6	-7	-7	-8	
% of sales	-4%	-3%	-2%	-2%	-2%	
Adj. EBIT	**22**	**22**	**36**	**62**	**89**	**41.3%**
Operating margin	10%	9%	12%	15%	16%	
Adj. EBITDA	**36**	**36**	**60**	**105**	**136**	**39.1%**
Operating margin	16%	15%	20%	25%	25%	
Financial result	-23	-6	-8	-11	-14	
% of sales	-10%	-3%	-3%	-3%	-3%	
Income Tax	-4	-3	-5	-9	-13	
Income tax rate	936%	-16%	-16%	-17%	-17%	
Adj. Net Profit	**-4**	**13**	**24**	**43**	**63**	**n.s.**
Net margin	-2%	6%	8%	10%	11%	
Adj. Dil. EPS	**-0.01**	**0.02**	**0.04**	**0.07**	**0.10**	**n.s.**
EPS seq. growth	-98%	-336%	78%	83%	45%	

Sources: Bryan, Garnier & Co. ests.

3.2. A cleaned-up balance sheet enabling development of production capacity

Naturally, the two successive capital increases undertaken in 2016 had a significantly positive impact on the group's balance sheet and solidity. However, the new group's profile also helped generate cash organically as of FY18e. This stems from an improvement in EBITDA prompted by higher volumes at the Bernin 2 plant (see Fig. 25).

Fig. 26: Cash generation improving considerably…

[in EURm]	FY16	FY17e	FY18e	FY19e	FY20e
EBITDA	**36**	**36**	**60**	**105**	**136**
Change in WCR	104	-135	-24	-30	-45
Other	-153	126	4	-5	4
Cash flow from operating activities	-12	27	40	71	94
Capex	-8	-24	-24	-30	-45
Free Cash Flow	**-21**	**3**	**16**	**41**	**49**
Acquisitions	-1	0	0	0	0
Other	36	0	0	0	0
Cash flow used for investing activities	27	-24	-24	-30	-45
Proceeds/Repayment of LT & ST debt	43	-111	0	0	0
Proceeds from issuance of shares	-1	152	0	0	0
Other	-30	0	0	0	0
Cash flow from financing activities	12	41	0	0	0
Total Cash flow	27	44	16	41	49
CTA (Cumulative translation adj.)	-1	0	0	0	0
Net increase in cash	26	44	16	41	49
Cash at beginning of period	23	49	93	109	149
Cash at end of period	**49**	**93**	**109**	**149**	**199**

Fig. 27: …helping reach net cash of EUR92m in FY20e

[in EURm]	2016	2017e	2018e	2019e	2020e
Cash and cash equivalents	49	93	109	149	199
Inventories	31	32	40	57	73
Account receivable Trade	40	41	53	74	95
Other	41	41	41	41	41
Total current assets	161	207	242	321	408
Property, plant and equipment	121	130	130	117	116
Intangible fixed assets	4	4	4	4	4
Deferred tax assets	0	0	0	0	0
Total non-current assets	164	173	173	160	159
Total assets	**325**	**380**	**416**	**482**	**567**
Account payable Trade	43	44	55	78	100
Current portion of LT debt	59	59	59	59	59
Accured expenses and payroll	0	0	0	0	0
Other	40	40	40	40	40
Current liabilities	142	143	154	177	199
LT debt less current portion	160	49	49	49	49
Deferred tax liabilities	0	0	0	0	0
Other non-current liabilities	31	31	31	31	31
Non-current liabilities	191	80	80	80	80
Total equity	-7	158	182	225	287
Total liabilities and Equity	**325**	**380**	**416**	**482**	**567**

Sources: Bryan, Garnier & Co. ests.

4. Risk/reward profile becoming attractive again

4.1. Our base case valued at EUR1.25 per share.

Our Fair Value of EUR1.25 stems from a DCF valuation. This points to upside potential of 26% relative to the current price.

Our DCF valuation is based on the following assumptions:

- **Our base scenario, which includes our estimates out to FY20e (see section 3).** As for other semiconductor players we cover, over the normalised period (FY21e to FY26e), we have applied a cyclical growth scheme. However, given the fundamental changes affecting Soitec's profile (reorganisation, exit from solar and lighting businesses, start-up of FD-SOI, RF-SOI 300mm…), we have not applied our normal method consisting of reproducing the characteristics of the previous cycle to the normalised period. We use a growth rate in linear decline throughout the normalised period, resulting in our growth rate to infinity of 2.5%.

- **We have applied EBIT margin of 10% in FY16 rising to 16% in FY20e and then falling in a linear manner to 15% until FY26e**, or the level of our long-term margin. This is the operating margin that the group is capable of generating once the load factor at its plants has reached a respectable level namely >85%, on average at the two Bernin 1 and Bernin 2 plants. The Singapore plant, which is currently empty, should only have a very small negative impact on margin when it starts up since it is set to fill up gradually, in line with the increase in volumes produced by the plan

- **WCR that we increase at a faster pace than sales over FY17e/FY20e in order to restore a normalised level of close to 8% at the end of the period (FY16e WCR of 1.7%) then maintained at 8% of sales over the normalised period.**

- **Investments moving in a non-linear way, associated with the group's growth which requires 1/ investments of around EUR40m to develop production of 400,000 FD-SOI wafers at Bernin 2 (or around EUR10m/100,000 wafers), 2/ investments of EUR20m per 100,000 wafers to boost the Singapore plant and 3/ maintenance capex.** Our change in investments is therefore dependent on the construction of capacity at the two plants until FY21e then falling in a linear manner to a level of 4.5% over the rest of the normalised period.

- **A low corporate tax rate out to FY21e in order to take account of the group's tax-loss carry-forwards, then a normal average tax rate of 34% as of FY22e.** Concerning the tax-loss carry-forwards, we apply the method of standard calculation, which consists of being exonerated from tax payments for the first EUR1m of taxable income, then exonerated for 50% for the remainder. The non-exonerated share is taxed at 34%.

- **WACC of 13.0%**. We apply a beta of 1.7x, or a reduction of 0.1pt relative to the beta applied so far for Soitc, which is explained by an improvement in the group's fundamentals. This is the highest beta in our universe, the second being Dialog (Neutral, FV EUR40) with a beta of 1.6x. In addition, we use a risk-free rate of 1.6% and a market risk premium of 7.0%. At the end of FY16,

the group had net debt of EUR168m, which was significantly lower in view of the two capital increases undertaken at the beginning of the summer 2016. With the two capital increases totalling EUR152m and reducing the group's theoretical net debt to EUR16m, we consider it more appropriate to use the FY17e net debt level of EUR14m to calculate the discount rate.

Fig. 28: WACC of 13.0%

WACC	
European risk-free interest rate	1.6%
Equity risk premium	7.0%
Beta	1.7
Return expected on equity	**13.2%**
Interest rate on debt	4.0%
Market Capitalization (EURm)	600
Net debt adjusted (EURm)	**14**
Entreprise value (EURm)	614
WACC	**13.0%**

Source: Bryan, Garnier & Co. ests.

Fig. 29: DCF, a FV of EUR1.25 or downside risk of 25%

in EURm (FYE 31/03)	**2017e**	**2018e**	**2019e**	**2020e**	**2021e**	**2022e**	**2023e**	**2024e**	**2025e**	**2026e**
Revenues	**239**	**303**	**428**	**550**	**687**	**832**	**977**	**1,110**	**1,221**	**1,297**
Change (%)	*2.5%*	*26.9%*	*41.1%*	*28.6%*	*24.8%*	*21.1%*	*17.4%*	*13.7%*	*9.9%*	*6.2%*
Adjusted EBIT	**22**	**36**	**62**	**89**	**111**	**133**	**155**	**174**	**189**	**199**
Adjusted operating margin	*9.1%*	*11.8%*	*14.6%*	*16.2%*	*16.2%*	*16.0%*	*15.9%*	*15.7%*	*15.5%*	*15.3%*
Tax	-3	-5	-9	-13	-32	-45	-53	-59	-64	-68
Tax rate	*15.9%*	*16.4%*	*16.7%*	*16.8%*	*28.7%*	*34.0%*	*34.0%*	*34.0%*	*34.0%*	*34.0%*
Net Operating income after tax	**19**	**31**	**54**	**76**	**79**	**88**	**102**	**115**	**125**	**131**
Capex, net	-24	-24	-30	-45	-41	-42	-44	-50	-55	-58
As a % of sales	*10.0%*	*8.0%*	*7.0%*	*8.2%*	*6.0%*	*5.1%*	*4.5%*	*4.5%*	*4.5%*	*4.5%*
Depreciation & amortisation	14	24	43	47	58	62	63	56	55	58
As a % of sales	*6.0%*	*8.0%*	*10.0%*	*8.5%*	*8.5%*	*7.5%*	*6.5%*	*5.0%*	*4.5%*	*4.5%*
WCR	5	13	28	43	54	65	77	87	96	102
As a % of sales	*2.0%*	*4.2%*	*6.6%*	*7.8%*	*7.8%*	*7.8%*	*7.8%*	*7.8%*	*7.8%*	*7.8%*
Change in working capital	-1	-8	-15	-15	-11	-11	-11	-10	-9	-6
Free cash flows	**9**	**23**	**51**	**63**	**86**	**97**	**110**	**110**	**116**	**125**
Discounted free cash flows	**9**	**20**	**39**	**42**	**51**	**50**	**51**	**45**	**42**	**40**

Total discounted FCF - 2017e-2026e	387
Discounted Terminal value - 2027e+	361
Enterprise value	**748**
+ Fair value of financial assets	9
- Net debt on 31/03/2017e	14
Equity value	**744**
Nbr of diluted shares (m)	606.041
Valuation per share (EUR)	**1.25**
Upside vs. current share price	25%

Op. margin \ WACC [in EUR]	12.0%	12.5%	13.0%	13.5%	14.0%
13%	1.29	1.21	1.15	1.09	1.03
14%	1.35	1.27	1.20	1.14	1.08
15%	1.41	1.32	**1.25**	1.18	1.12
16%	1.47	1.38	1.30	1.23	1.16
17%	1.53	1.43	1.35	1.28	1.21

Source: Bryan, Garnier & Co.

4.2. Current valuation close to our bear case

Although it has massively changed in recent months, the **Soitec investment case remains** complex and particularly **dependent on the success of the take-off in FD-SOI**. Under this framework, we have drawn up two complementary scenarios in order to **assess downside risk if the take-off in FD-SOI does not go ahead as quickly as expected**, as well as a rapid take-off in the technology, similar to the scenario implying the realisation of the incentive plan.

For our bear case scenario, we have applied a one-year delay to our estimates for ramp-up in FD-SOI.

We value this pessimistic scenario at EUR0.94.

For our bear case scenario, we have applied a one-year delay to our estimates for ramp-up in FD-SOI. Given the advanced development of FD-SOI projects at STMicroelectronics and NXP (in production at Samsung), we are making no changes to our forecasts for these two customers. In contrast, this scenario implies a 70% decline in production at GlobalFoundries over FY20e, or around 150,000 wafers (vs. c. 440,000 in our base case). Growth in the following years, as well as change in production capacity (capex) are also affected by the slower take-off of FD-SOI in this scenario.

Using the valuation items defined previously for our base case, we value this pessimistic scenario at EUR0.94, which is very close to the levels that Soitec is currently trading at.

Fig. 30: Bear case valuing Soitec at EUR0.94, or close to the current price

in EURm (FYE 31/03)	2017e	2018e	2019e	2020e	2021e	2022e	2023e	2024e	2025e	2026e
Revenues	**239**	**263**	**329**	**427**	**539**	**658**	**778**	**889**	**981**	**1,044**
Change (%)	*2.5%*	*10.0%*	*25.0%*	*30.0%*	*26.1%*	*22.1%*	*18.2%*	*14.3%*	*10.4%*	*6.4%*
Adjusted EBIT	**22**	**30**	**40**	**60**	**76**	**94**	**112**	**129**	**143**	**154**
Adjusted operating margin	*9.1%*	*11.5%*	*12.3%*	*14.1%*	*14.1%*	*14.2%*	*14.4%*	*14.5%*	*14.6%*	*14.7%*
Tax	-3	-5	-7	-10	-13	-29	-38	-44	-49	-52
Tax rate	*15.9%*	*16.4%*	*16.7%*	*16.8%*	*16.8%*	*31.2%*	*34.0%*	*34.0%*	*34.0%*	*34.0%*
Net Operating income after tax	**19**	**25**	**34**	**50**	**63**	**64**	**74**	**85**	**95**	**102**
Capex, net	-24	-26	-33	-43	-32	-34	-33	-29	-23	-15
As a % of sales	*10.0%*	*10.0%*	*10.0%*	*10.0%*	*6.0%*	*5.1%*	*4.2%*	*3.3%*	*2.4%*	*1.5%*
Depreciation & amortisation	14	26	33	43	32	34	33	29	23	15
As a % of sales	*6.0%*	*10.0%*	*10.0%*	*10.0%*	*6.0%*	*5.1%*	*4.2%*	*3.3%*	*2.4%*	*1.5%*
WCR	5	5	7	8	11	13	15	18	20	21
As a % of sales	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
Change in working capital	-1	0	-1	-2	-2	-2	-2	-2	-2	-1
Free cash flows	**9**	**25**	**32**	**48**	**61**	**62**	**71**	**83**	**93**	**100**
Discounted free cash flows	**9**	**21**	**24**	**32**	**36**	**32**	**33**	**34**	**33**	**32**

Total discounted FCF - 2017e-2026e	286
Discounted Terminal value - 2027e+	295
Enterprise value	**581**
+ Fair value of financial assets	9
- Net debt on 31/03/2017e	14
Equity value	**568**
Nbr of diluted shares (m)	606.041
Valuation per share (EUR)	**0.94**
Upside vs. current share price	-6%

		WACC				
	[in EUR]	12.0%	12.5%	13.0%	13.5%	14.0%
Op. margin	13%	0.97	0.91	0.86	0.81	0.77
	14%	1.02	0.95	0.90	0.85	0.80
	15%	1.06	1.00	**0.94**	0.88	0.84
	16%	1.11	1.04	0.98	0.92	0.87
	17%	1.16	1.09	1.02	0.96	0.91

Source: Bryan, Garnier & Co.

4.3. Targets of the incentive plan would value Soitec at EUR1.59

Soitec has implemented an **incentive plan for management** that is only triggered under performance conditions based 1/ for 50% on the delivery of targets based on EBITDA criteria, i.e. if the group manages to generated **EUR104m in EBITDA on average over FY18 and FY19** and 2/ for 50% on the delivery of targets based on the stockmarket criteria.

These details were discussed at the AGM and help provide a more detailed vision of internal targets for sales growth over the medium term. They compare to our central scenario showing average FY18/FY19 EBITDA of EUR83m. Average EBITDA of EUR104m over FY18/FY19 could correspond to the following scenario:

Fig. 31: Scenario triggering activation of the incentive plan

[in EURm]	2016	2017e	2018e	2019e	2020e	CAGR 16/19e
Sales	**233**	**239**	**333**	**488**	**657**	**27.9%**
Seq. growth	5%	2%	39%	46%	35%	
Gross profit	**62**	**70**	**105**	**159**	**217**	
Gross margin	27%	29%	32%	33%	33%	
R&D	-8	-22	-30	-42	-56	
% of sales	-3%	-9%	-9%	-9%	-9%	
G&A	-22	-20	-27	-37	-45	
% of sales	-9%	-9%	-8%	-8%	-7%	
S&M	-10	-6	-8	-8	-10	
% of sales	-4%	-3%	-2%	-2%	-2%	
EBIT	**22**	**22**	**41**	**71**	**106**	**47.1%**
Operating margin	10%	9%	12%	15%	16%	
EBITDA	**36**	**36**	**81**	**127**	**185**	**51.9%**
Operating margin	16%	15%	24%	26%	28%	
Financial result	-23	-6	-8	-12	-16	
% of sales	-10%	-3%	-3%	-3%	-3%	
Income Tax	-4	-3	-5	-10	-15	
Income tax rate	936%	-16%	-16%	-17%	-17%	
Net Profit	**-4**	**13**	**27**	**49**	**75**	**n.s.**
Net margin	-2%	6%	8%	10%	11%	
Dil. EPS	**-0.01**	**0.02**	**0.05**	**0.08**	**0.12**	**n.s.**
EPS seq. growth	-98%	-336%	106%	80%	52%	

Source: Bryan, Garnier & Co ests.

This implies 1/ a doubling in sales over FY16e/FY19e thanks to the rapid ramp-up in FD-SOI to reach maximum production capacity at Bernin 2 as of FY19 (380,000 wafers in the scenario above and other unchanged 300mm scenarios) and 2/ an automatic improvement in the margin to reach average EBITDA for FY18e/FY19e of EUR104m.

We value this scenario at EUR1.59.

This scenario would imply production of 100% of FD-SOI capacity at Bernin 2 as of FY19 (vs. ~65% in our central scenario). It shows a valuation of Soitec at EUR1.59, or significant upside potential of 60%.

Fig. 32: Upside of 60% if management can deliver the targets of the incentive plan

in EURm (FYE 31/03)	2017e	2018e	2019e	2020e	2021e	2022e	2023e	2024e	2025e	2026e
Revenues	**239**	**333**	**488**	**657**	**855**	**1,072**	**1,296**	**1,508**	**1,684**	**1,803**
Change (%)	*2.5%*	*39.5%*	*46.4%*	*34.7%*	*30.1%*	*25.5%*	*20.9%*	*16.3%*	*11.7%*	*7.1%*
Adjusted EBIT	**22**	**41**	**71**	**106**	**138**	**172**	**206**	**236**	**261**	**277**
Adjusted operating margin	*9.1%*	*12.3%*	*14.6%*	*16.2%*	*16.2%*	*16.0%*	*15.9%*	*15.7%*	*15.5%*	*15.3%*
Tax	-3	-7	-12	-18	-46	-58	-70	-80	-89	-94
Tax rate	*15.9%*	*16.4%*	*16.7%*	*16.8%*	*33.5%*	*34.0%*	*34.0%*	*34.0%*	*34.0%*	*34.0%*
Net Operating income after tax	**19**	**34**	**59**	**89**	**92**	**113**	**136**	**156**	**172**	**183**
Capex, net	-24	-27	-100	-40	-56	-60	-59	-68	-76	-81
As a % of sales	*10.0%*	*8.0%*	*20.5%*	*6.1%*	*6.6%*	*5.5%*	*4.5%*	*4.5%*	*4.5%*	*4.5%*
Depreciation & amortisation	14	40	56	79	87	88	83	68	76	81
As a % of sales	*6.0%*	*12.0%*	*11.5%*	*12.0%*	*10.1%*	*8.3%*	*6.4%*	*4.5%*	*4.5%*	*4.5%*
WCR	5	14	32	52	67	84	102	118	132	142
As a % of sales	*2.0%*	*4.2%*	*6.6%*	*7.8%*	*7.8%*	*7.8%*	*7.8%*	*7.8%*	*7.8%*	*7.8%*
Change in working capital	-1	-9	-18	-20	-16	-17	-18	-17	-14	-9
Free cash flows	**9**	**38**	**-3**	**108**	**107**	**125**	**142**	**139**	**159**	**173**
Discounted free cash flows	**9**	**33**	**-2**	**72**	**63**	**65**	**65**	**57**	**57**	**55**

Total discounted FCF - 2017e-2026e	474
Discounted Terminal value - 2027e+	502
Enterprise value	**976**
+ Fair value of financial assets	9
- Net debt on 31/03/2017e	14
Equity value	**962**
Nbr of diluted shares (m)	606.041
Valuation per share (EUR)	**1.59**
Upside vs. current share price	60%

	WACC				
[in EUR]	12.0%	12.5%	13.0%	13.5%	14.0%
Op. margin 13%	1.64	1.54	1.45	1.37	1.30
Op. margin 14%	1.72	1.62	1.52	1.43	1.36
Op. margin 15%	1.80	1.69	**1.59**	1.50	1.42
Op. margin 16%	1.89	1.77	1.66	1.56	1.48
Op. margin 17%	1.97	1.84	1.73	1.63	1.54

Source: Bryan, Garnier & Co.

4.4. Multiples showing upside

Soitec has a specific profile, the group is in the midst of a turnaround phase, and prospective growth is particularly strong. From the investor's point of view, this rapid growth has a price, but it is difficult to find it in a valuation using standard multiples, especially 2017e or 12m yoy multiples.

However, we consider it instructive to simulate a valuation for Soitec using multiples that take into account growth. With a net negative result in FY16, use of PEG is impossible, since our sample is mixed in terms of business models. As such, we have taken into account **the EV/EBITDA multiple relative to average EBITDA growth over three years.**

To build our samples, we have brought together 1/ wafer suppliers who are both suppliers of Soitec wafers (since the group does not produce base wafers itself, but significantly improves the wafers before selling them on) and active in the same wafer market, 2/ semiconductor components markets that have a similar position in the semiconductors value chain, i.e. manufacturers' suppliers and, 3/ leading players in RF that help reflect momentum in demand and the end market. In all, our sample is made up of 14 companies.

Fig. 33: A discount of 47% taking into account growth potential

		EBITDA – 3y fwd avg growth	FY17 EV/EBITDA	EV/EBITDA/Growth
Wafer suppliers	Shin Etsu	8.0%	5.5x	0.7x
	SUMCO	17.4%	8.7x	0.5x
Equipment manufacturers	ASML	14.9%	20.4x	1.4x
	Applied Mat.	15.8%	11.7x	0.7x
	KLA-Tencor	18.2%	11.3x	0.6x
	Lam Reserach	18.2%	8.0x	0.4x
	Teradyne	6.8%	9.1x	1.3x
	Tokyo Electron	15.9%	7.1x	0.4x
	Nikon	1.4%	7.2x	5.3x
	ASM Intl	10.0%	13.9x	1.4x
	ASM Pacific	17.2%	11.1x	0.6x
RF Fabless	Qualcomm	1.9%	9.3x	4.9x
	Skyworks	9.0%	8.8x	1.0x
	Qorvo	25.8%	7.7x	0.3x
Average				1.4x
Median				0.7x
Soitec		42.6%	16.7x	0.4x
	Discount vs. median			-47%

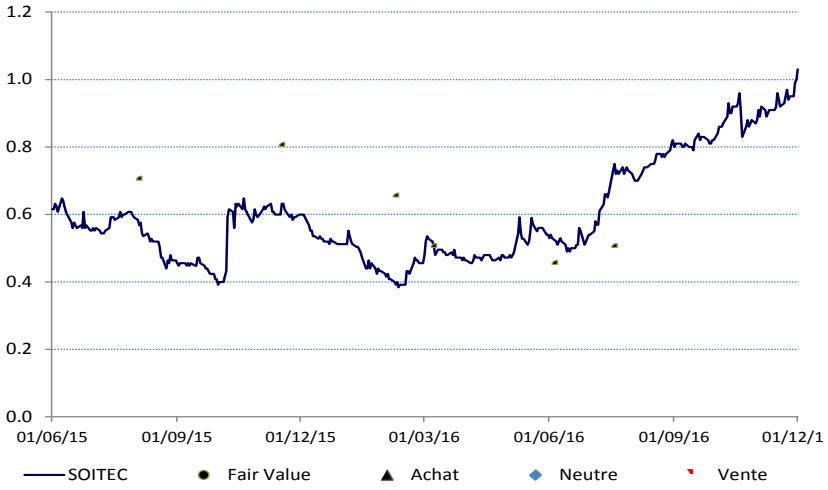
Sources: Thomson Reuters I.B.E.S.; Bryan, Garnier & Co. ests.

This method therefore points to a valuation of **EUR1.42 per share,** although given the number of faults in this valuation method (no direct peers in a mixed sample, questionable three-year EBITDA estimates for certain parts of the sample etc.), **we have not retained this valuation method in our FV calculation.**

Also for information purposes, an exit multiples method based on discounted FY19e EBITDA at Soitec (or EUR79.7m) and 2017e EV/EBITDA multiples of 9.1x for the sample above, value Soitec at **EUR1.19 per share**

Price Chart and Rating History

Soitec



Ratings		
Date	**Ratings**	**Price**
23/12/2014	NEUTRAL	EUR0,96
22/12/2014	Under review	EUR2,11
12/11/2014	BUY	EUR1,93

Target Price	
Date	**Target price**
21/07/2016	EUR0,5
07/06/2016	EUR0,45
10/03/2016	EUR0,5
11/02/2016	EUR0,65
19/11/2015	EUR0,8
06/08/2015	EUR0,7
29/05/2015	EUR0,75
24/03/2015	EUR1,1
20/01/2015	EUR0,95
23/12/2014	EUR0,85
22/12/2014	Under review
12/11/2014	EUR2,6

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