![EDISON]

Thin Film Electronics

Q117 results

Strong revenue growth outlook in coming quarters

Tech hardware & equipment

Thinfilm (THIN) has had a very strong few months in terms of business development. EAS orders are back in volume (backlog: 16m units) and the launch of the CNECT platform has also created momentum in pilots and field trial orders for THIN's NFC labels. Additionally, after many delays, Thinfilm has launched its first hybrid commercial sensor product, using low-cost R2R technology to print the displays in Sweden. With US R2R plans reported to be on track and on budget, we see good potential for positive newsflow-led impetus for the share price in coming quarters.

Year end	Revenue ($m)	PBT* ($m)	EPS* (c)	DPS (c)	EV/sales (x)	EV/EBITDA (x)	Yield (%)
12/15	4.4	(28.3)	(5.3)	0.0	75.7	N/A	N/A
12/16	3.8	(43.0)	(6.6)	0.0	75.1	N/A	N/A
12/17e	10.8	(42.5)	(5.2)	0.0	31.8	N/A	N/A
12/18e	48.3	(29.9)	(3.7)	0.0	7.9	N/A	N/A

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

R2R rollout is on track... and may be accelerated

Management has reported that plant acquisition for the move to roll-to-roll (R2R) printing in the US is on track and on budget ($32m). CEO Davor Sutija has also flagged the potential to accelerate the programme if demand continues to surprise on the upside. In this case we see a likely positive impact on the group DCF valuation as likely higher cash flows from the stronger demand scenario offset higher early capex impact.

First quarter results support full year forecasts

We see the Q1 results as supportive of our full year forecasts. EBITDA and pre-tax losses for the quarter at $11.4m and $11.5m were 29% and 26% of our full year forecast. Stripping out cash absorbed by capex and capex down payments, underlying cash burn was 33% of our full year expectation. Helped by the positive momentum from current pilot and trial orders, management believes that sales of NFC products could double in Q2 and double again in Q3, which may require us to increase forecasts as the year progresses. EAS sales are also expected to continue to rise over the next two quarters from the 5m unit sales in Q1. This reflects THIN's current 16m unit order backlog and the potential for further order inflows if its EAS tags are qualified for use in denim, as is likely.

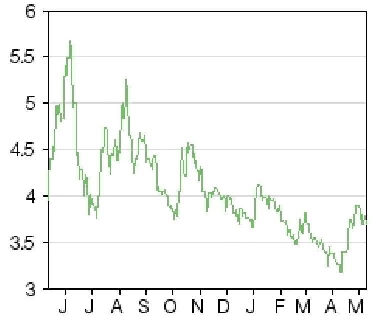
Valuation: NOK8.19 DCF valuation still supported

Over the last month, Thinfilm shares have staged a 17% rally after a declining trend since late October. We believe that recent news of new pilot programmes, the coming together of the CNECT platform and the publication of an innovative marketing book – *NFC Mobile Marketing for Dummies* – may have awakened investors to the potential upside in demand for NFC. Our DCF valuation of NOK8.19 remains unchanged and has been helped by recent weakness in the Norwegian krone. It reflects our positive expectations of the strong pick-up in both output and demand with the launch of R2R printing in San Jose over the next 18 months.

10 May 2017

Price	**NOK3.69**
Market cap	**NOK3,021m**
	NOK8.631/US$
Net cash ($m) at 31 March 2017	40.1
Shares in issue	818.8m
Free float	93.0%
Code	THIN
Primary exchange	Oslo
Secondary exchange	OTCQX

Share price performance



%	1m	3m	12m
Abs	13.2	3.1	(9.1)
Rel (local)	10.4	1.4	(21.8)
52-week high/low		NOK5.7	NOK3.2

Business description

Thin Film Electronics (Thinfilm) is a global leader in NFC marketing and smart-packaging solutions using printed electronics. It creates printed tags, labels, and systems that include memory, sensors, displays, and wireless communications at low cost points vs conventional electronics.

Next events

Q217 results	18 August 2017
Q317 results	10 November 2017

Analysts

Anna Bossong +44 (0)20 3077 5737

Katherine Thompson +44 (0)20 3077 5730

tech@edisongroup.com

Edison profile page

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Business update

Thinfilm has had a very strong last few months in terms of business development in its key areas of EAS (Electronic Article Surveillance for anti-theft purposes), NFC and sensor labels. EAS orders have resumed in volume after trailing off in H216 (on need for a new wet inlay layer) and prospects for further growth in coming quarters appear good based on the existing 16m order backlog and the potential for THIN's EAS tags to qualify for inclusion in denim items with its go-to-market partner. The launch of the CNECT platform for NFC labels has enabled the group to tie its tags into a complete marketing suite, which is attracting significant interest from new brands. Management sees the potential to double and then redouble revenues from NFC tags over each of the next two quarters helped by the momentum already created. Also, after many delays in recent years, Thinfilm has launched its first hybrid commercial sensor product, using R2R technology to cheaply print displays in Sweden. Coming quarters should bring yet further developments in all three areas, with the launch of R2R printing of EAS tags later this year, signalling a new era for the group.

R2R plant on track: Management considering acceleration

Thinfilm management has reported that capital expenditure on the new R2R facility is on track and on budget. CEO Davor Sutija has suggested that the programme may be accelerated if Thinfilm experiences strong order flows from current NFC pilot and field trial orders. No decisions have yet been taken but we understand that this would likely take the form of capex spending being brought forward by a quarter or so. This means that we would expect approximately one-quarter of 2018 capex to fall into the 2017 capex spend. If it does, however, then the total 2018 capex should be reduced by a similar amount. With our forecast of R2R capex at $14m in 2018 this could mean an additional spend of c $3-4m on PPE in 2017 (but then also the same reduction in 2018). Rather than bringing production schedules forward by a similar amount, we understand that management may decide to spend the extra few months on process development work to further improve start-up production yields. This could be expected to have a positive impact on production levels from the launch of NFC production in H218.

EAS: Orders flowing in again, giving rise to a 16m unit backlog

After a hiatus in late 2016 caused by the need to incorporate a wet inlay (glue layer) to its EAS (anti-theft) tags, there was a surge in EAS tag sales in the first quarter of this year. Unit sales increased 10-fold from Q416 to 5m as new orders flowed in from THIN's go-to-market partner. The order backlog was increased by a further 11m to 16m units in April, which, assuming a unit sales price of 5 cents, should add approximately $0.8m to revenues in coming quarters.

At the same time THIN has reduced costs of EAS tag manufacture by a 500-600 fold increase in batch sizes, led by die (label size) shrinkage. Helped by lower price points there also appears to be good potential for THIN to qualify for denim apparel with the lead customer of its go-to-market partner. At the same time, we understand that this customer has indicated that it will roll out the use of printed electronic tags across its worldwide operations, which brings a further potential boost to order sizes. This comes at a good time, with THIN planning to transfer EAS production to its R2R facility in Q417, with a resulting increase in annual capacity to 1.2bn units, with substantially reduced unit costs.

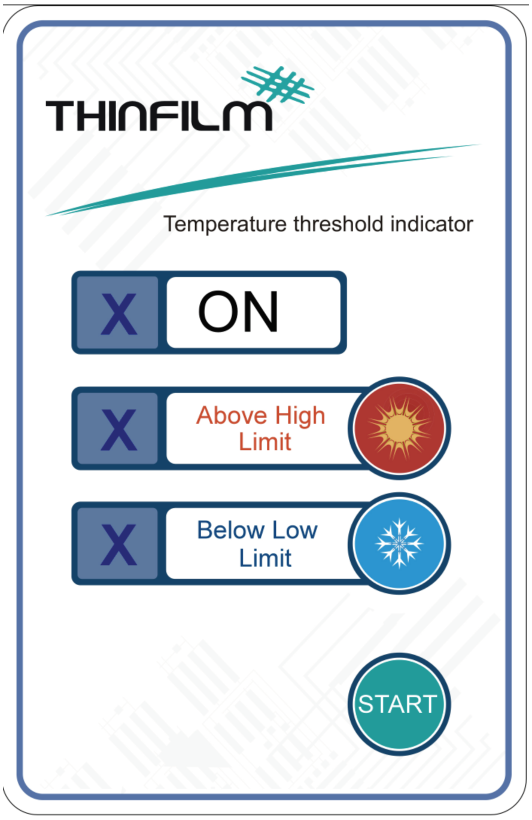
CNECT platform strengthens the NFC label proposition

Thinfilm launched its CNECT cloud-based NFC marketing platform on 22 February (see our note, Cloud portal launch strengthens NFC proposition, 6 March 2017), but has since announced that it now has four live field trials ongoing with CNECT, covering markets in the US, Europe, China and

Canada. The trials consist of Coronado Brewery, a Fortune 500 pharmaceutical company, a medical marijuana dispensary, an Asian cosmetics firm and alcoholic beverage producer Northern Lights Spirits. Preparation for a further six to ten trials are also underway and the company is shortly to launch “IoT Connect in a Box”, which will provide brand managers with a set of different NFC tag types to test different configurations and the abilities of the CNECT platform. With the launch on 28 April of Thinfilm’s book, produced together with publisher John Wiley and Sons, *NFC Mobile Marketing for Dummies* (see Exhibit 2), the company has created a complete ecosystem for its NFC labels encompassing hardware, tracking, analytics and education.

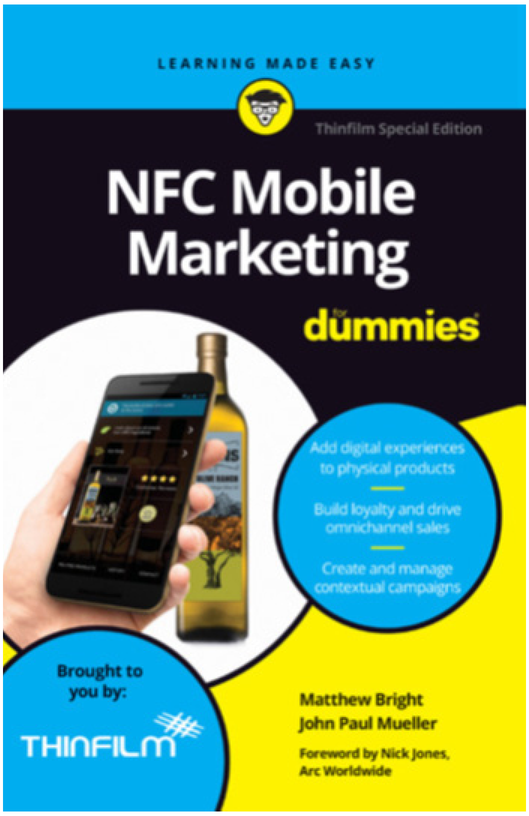
It is worth noting that the Asian cosmetics company is trialling NFC OpenSense labels for a quite different use case than seen to date. It is looking to monitor assembly of its products in China to ensure that only authentic components that are still fresh are incorporated in its products.

Exhibit 1: Thinfilm Smart Sensor Labels



Source: Thinfilm

Exhibit 2: Cover of Thinfilm’s new book *NFC Mobile Marketing for Dummies*



Source: Thinfilm

First commercial sales of sensors – using R2R printed displays

Official launch of Thinfilm’s new temperature sensors is set to take place in Q417, but Thinfilm was able to deliver its first commercial shipment of the product to two distributor partners in the first quarter. Emerson (which acquired sensor label specialist PakSense in August 2016) is to market the labels to the perishable foods industry and Temptime will be used to distribute the product to the drug industry.

The company’s hybrid product (see display in Exhibit 1) contains standard silicon chip based electronics for the temperature sensing component, added to a printed electronics display produced-in-house using THIN technology. This enables the company to make the tags thinner and at a lower cost point than standard tags employing silicon chips. In comparison with the cheaper chemical alternatives, the clear display and on switch functionality enable users to quickly determine which stock has been compromised and to store the tags in their off state without regard to the temperature (which would trigger reactions in the chemical labels).

Thinfilm has been able to reduce the cost of producing these displays by printing them in volumes of 10s of millions using pre-existing R2R technology in its Linkoping plant in Sweden. In addition, given the more complex nature of back-end work in the sensor market, the company is very pleased to have partnered with a tier-two back-end operator in China, which has the capacity to assemble high volumes of the product, giving the product a high degree of scalability. Thinfilm expects, at least initially, to sell most of its products via its partners, which are established distributors in the sensor field. Price points are likely to be between those of chemical and electronic labels, ie in the $2-6 range before volume and distributor discounts (each potentially 30-40%).

Thinfilm is likely to add further sensor labels to its range in coming years featuring different combinations of sensors and features aimed at different verticals.

Exhibit 3: Thinfilm Q117 results summary

US$000s	Q117	Q117 change y-o-y (%)	Q117 % of FY17e	Q117 change q-o-q (%)	Q116	Q416	2017e	2016	Change y-o-y (%)
Sales Revenue	677	351.3	7.9	45.4	150	466	8,555	1,460	485.9
Other Operating revenue	319	(42.7)	15.6	(28.7)	557	447	2,050	1,964	4.4
Other Income	120	15.4	54.7	13.9	104	105	219	421	(47.9)
Total revenue	**1,115**	**37.6**	**10.3**	**9.6**	**811**	**1,018**	**10,824**	**3,845**	**181.5**
Payroll	(6,151)	32.3	26.6	13.7	(4,648)	(5,410)	(23,115)	(20,674)	11.8
Premises, supplies	(3,672)	48.1	39.5	(13.9)	(2,479)	(4,263)	(9,288)	(11,970)	(22.4)
Other operating costs	(2,315)	20.8	13.9	(10.3)	(1,916)	(2,581)	(16,694)	(8,327)	100.5
Total operating costs	**(12,514)**	**35.6**	**24.7**	**(0.4)**	**(9,229)**	**(12,561)**	**(50,668)**	**(42,151)**	**20.2**
EBITDA	**(11,399)**	**35.4**	**28.6**	**(1.2)**	**(8,418)**	**(11,543)**	**(39,844)**	**(38,306)**	**4.0**
less Share based payments	(377)	102.7	24.0	22.4	(186)	(308)	(1,572)	(1,180)	33.2
EBITDA (norm)	(11,022)	33.9	28.8	(1.9)	(8,232)	(11,235)	(38,272)	(37,126)	3.1
less Expensed R&D	(3,464)	31.3	21.0	1.4	(2,638)	(3,417)	(16,506)	(15,068)	9.5
EBITDA (norm, excl expensed R&D)	(7,935)	41.8	36.5	1.5	(5,594)	(7,818)	(21,766)	(22,058)	(1.3)
D&A	(900)	63.0	22.0	(20.1)	(552)	(1,126)	(4,087)	(3,176)	28.7
Operating profit	**(12,299)**	**37.1**	**28.0**	**(2.9)**	**(8,970)**	**(12,669)**	**(43,931)**	**(41,482)**	**5.9**
Operating profit (norm)	(11,922)	35.7	28.1	(3.6)	(8,784)	(12,361)	(42,359)	(40,302)	5.1
Net financial items	788	NA	(483.6)	(155.5)	(967)	(1,421)	(163)	(2,731)	(94.0)
Profit Before Tax	**(11,510)**	**15.8**	**26.1**	**(18.3)**	**(9,937)**	**(14,090)**	**(44,093)**	**(44,213)**	**(0.3)**
Profit Before Tax (norm)	(11,133)	14.2	26.2	(19.2)	(9,751)	(13,782)	(42,522)	(43,033)	(1.2)
Tax	(1)	NA	N/A	(105.3)	(299)	19.0	0.0	(282.0)	NA
Profit After Tax	**(11,511)**	**12.5**	**26.1**	**(18.2)**	**(10,236)**	**(14,070)**	**(44,093)**	**(44,495)**	**(0.9)**
Profit After Tax (norm)	(11,511)	14.5	27.1	(16.4)	(10,050)	(13,762)	(42,522)	(43,315)	(1.8)
EPS (norm) ($)	**(0.014)**	**(13.6)**	**27.1**	**(23.3)**	**(0.016)**	**(0.018)**	**(0.052)**	**(0.066)**	**(20.8)**
Earnings per ADR (norm) ($)	(0.141)	(13.6)	27.1	(23.3)	(0.163)	(0.184)	(0.520)	(0.657)	(20.8)
Cash flow from operations	(17,045)	172.6	44.0	65.1	(6,253)	(10,325)	(38,752)	(37,530)	3.3
Purchases of PPE	(4,752)	179.6	28.0	207.7	(1,700)	(1,544)	(17,000)	(4,464)	280.8
Cash flow from investments	(4,866)	174.7	28.4	176.9	(1,771)	(1,757)	(17,163)	(5,262)	234.6
Cash burn (Ops and investments)	**(21,911)**	**173.1**	**39.2**	**81.4**	**(8,024)**	**(12,082)**	**(55.915)**	**(42,792)**	**31.7**
Cash flow from financing activities	24	(99.9)	(8.8)	(100.0)	40,950	59,475	(272)	101,124	(100.3)
Total cash	**52,597**	**7.1**	**N/A**	**(29.1)**	**49,122**	**74,205**	**18,018**	**74,205**	**(76.9)**
Net debt (cash)/equity (%)	(73)	(15.6)	N/A	(17.5)	(87)	(89)	(44)	(89)	(52.3)
Net cash/(debt)	**40,061**	**(18.4)**	**N/A**	**(34.7)**	**49,122**	**61,355**	**5,887**	**61,355**	**(91.9)**

Source: Thinfilm accounts, Edison Investment Research

First quarter 2017 results review

Thinfilm achieved a 38% increase in revenues to $1.1m in Q117, boosted by a revival of sales (over 5m units) of EAS anti-theft tags. Continued focus on process development ahead of the move to R2R printing resulted in an ongoing high level of raw material expenses, resulting in a 48% y-o-y increase in premises and supplies costs. At the same time, additional technical hires in the new US plant resulted in payroll rising 32%. This contributed to a 35% increase in EBITDA losses to $11.4m. FX gains resulted in a positive financial line and enabled net losses to rise only 12% to $11.5m.

Down payments for equipment orders for the new R2R plant absorbed a high $4.1m of working capital, with purchases of plant and equipment an additional $4.7m. Together with operating cash outflows this led to $21.9m outflows from operations and investment, leading to a $21.6m decline in cash balances to $52.6m.

EBITDA and pre-tax losses for the quarter were 29% and 26% of our full year forecast (the latter helped by non-cash FX gains). We see these figures as supportive of our full year estimates based on the company's and our expectation that revenues from NFC and EAS product sales should increase in coming quarters. The cash burn in the quarter at $21.9m represents a high 39% of our full year expectation of $56.4m. Stripping out the $9.0m of cash absorbed by capex ($4.9m) and capex down-payments ($4.2m) reported in working capital in Q117 gives rise to $12.9m non-capex cash burn, which represents 33% of the full year $38.9m in forecast cash burn stripping out our assumption of $17.0m capex. In coming quarters, we assume that growth in operating revenues will boost operating cash flows from the Q117 level to enable the company to reach our full year expectations. If the mooted acceleration of R2R capex does take place we assume that the company will employ an additional $3-4m in capex this year with a corresponding increase in cash burn, offset by a corresponding reduction in 2018.

Changes in forecast

Apart from minor rounding differences in the 2018 P&L, we have made two changes to our model since our last report, both solely affecting the balance sheet. The first is a $269k reduction in the 2016 cash balance to $74.2m occurring as a result of an input error in our model. This reduction carries forward into our forecasts of cash balances.

The second is an adjustment to our cash balances of the $473k cash raised from share issues and the conversion of subscription rights thus far this year, the latest being the raising of $449k (NOK3.87m) from the exercise of employee subscription rights. This has resulted in the issue of 2.06m shares, to bring the number of shares in issue to 818.8m.

Netting these changes has resulted in a $0.2m increase in our forecast net cash balances at end-2017 to $5.9m and a $0.2m reduction in net debt in 2018 to $32.8m (including finance lease liabilities that are treated as debt of $11.0m).

These changes have not materially altered our per share DCF valuation, which in Norwegian krone terms has been strengthened by the 3.1% depreciation in the krone vs the dollar since our last update.

Exhibit 4: Financial summary

	US$000s	2014	2015	2016	2017e	2018e
Year end December		IFRS	IFRS	IFRS	IFRS	IFRS
PROFIT & LOSS						
Revenue		4,479	4,413	3,845	10,824	48,333
EBITDA (norm)		(23,550)	(29,187)	(37,126)	(38,272)	(23,362)
Operating Profit (norm, before amort. and except.)		(24,855)	(30,724)	(40,302)	(42,359)	(29,244)
Intangible Amortisation		0	0	0	0	0
Exceptionals		0	0	0	0	0
Share-based payments		(941)	(1,064)	(1,180)	(1,572)	(1,706)
Operating Profit		(25,796)	(31,788)	(41,482)	(43,931)	(30,950)
Net Interest		701	2,406	(2,731)	(163)	(680)
Profit Before Tax (norm)		(24,155)	(28,318)	(43,033)	(42,522)	(29,923)
Profit Before Tax (FRS 3)		(25,096)	(29,382)	(44,213)	(44,093)	(31,630)
Tax		0	0	(282)	0	0
Profit After Tax (norm)		(24,155)	(28,318)	(43,315)	(42,522)	(29,923)
Profit After Tax (FRS 3)		(25,096)	(29,382)	(44,495)	(44,093)	(31,630)
Average Number of Shares Outstanding (m)		493.5	535.4	659.1	817.8	818.8
EPS - normalised (c)		(4.9)	(5.3)	(6.6)	(5.2)	(3.7)
EPS - (IFRS) (c)		(5.1)	(5.5)	(6.8)	(5.4)	(3.9)
Dividend per share (c)		0.0	0.0	0.0	0.0	0.0
EBITDA Margin (%)		N/A	N/A	N/A	N/A	N/A
Operating Margin (before GW and except.) (%)		N/A	N/A	N/A	N/A	N/A
BALANCE SHEET						
Fixed Assets		7,189	10,390	24,903	36,751	43,804
Intangible Assets		2,319	2,602	3,142	3,142	3,142
Tangible Assets		4,870	7,788	9,155	22,068	30,186
Investments		0	0	12,607	11,542	10,476
Current Assets		33,870	19,425	79,231	25,124	11,511
Stocks		451	367	1,086	2,843	3,130
Debtors		2,565	3,118	3,940	4,237	7,869
Cash		30,854	15,940	74,205	18,045	513
Other		0	0	0	0	0
Current Liabilities		(4,748)	(5,170)	(8,058)	(9,632)	(34,882)
Creditors		(4,748)	(5,170)	(7,789)	(9,363)	(12,613)
Short term borrowings		0	0	(269)	(269)	(22,269)
Long Term Liabilities		0	0	(12,581)	(11,863)	(11,040)
Long term borrowings		0	0	(12,581)	(11,863)	(11,040)
Other long term liabilities		0	0	0	0	0
Net Assets		36,311	24,645	83,495	40,381	9,392
CASH FLOW						
Operating Cash Flow		(24,079)	(26,036)	(37,248)	(38,752)	(24,030)
Net Interest		569	146	88	(163)	(680)
Tax		0	0	(282)	0	0
Capex		(3,217)	(4,751)	(4,806)	(17,000)	(14,000)
Acquisitions/disposals		(2,700)	(799)	(544)	0	0
Financing		16,477	16,527	101,057	473	0
Dividends		0	0	0	0	0
Net Cash Flow		(12,949)	(14,914)	58,265	(55,442)	(38,709)
Opening net debt/(cash)		(43,803)	(30,854)	(15,940)	(61,355)	(5,913)
Finance leases initiated		0	0	(12,850)	0	0
Other		0	0	0	0	0
Closing net debt/(cash)		(30,854)	(15,940)	(61,355)	(5,913)	32,797

Source: Thinfilm accounts, Edison Investment Research

Frankfurt +49 (0)69 78 8076 960
Schumannstrasse 34b
60325 Frankfurt
Germany

London +44 (0)20 3077 5700
280 High Holborn
London, WC1V 7EE
United Kingdom

New York +1 646 653 7026
245 Park Avenue, 39th Floor
10167, New York
US

Sydney +61 (0)2 8249 8342
Level 12, Office 1205
95 Pitt Street, Sydney
NSW 2000, Australia