

Thin Film Electronics

Private placement

\$63m share issue to fund development into 2018

Thin Film Electronics (Thinfilm) has announced a private placement to raise NOK529m (\$62.6m) at an issue price of NOK3.91 per share. The funds are to be used to prepare and equip the new roll-to-roll facility in San Jose as well as to cover operating costs in 2017 and 2018. Based on revised model assumptions, we estimate they should be sufficient to bridge all but \$21m of Thinfilm's future cash requirements ahead of it becoming free cash flow generative in 2019. As such, we expect this issue to greatly reduce investor concerns about future funding needs and potential further equity dilution. Adjusting for the increase in the number of shares, we have revised our DCF valuation by 5% from NOK8.58 to NOK8.19 per share.

Year end	Revenue (\$m)	PBT* (\$m)	EPS* (c)	DPS (c)	EV/sales (x)	EV/EBITDA (x)	Yield (%)
12/14	4.5	(24.2)	(4.9)	0.0	74.7	N/A	N/A
12/15	4.4	(28.3)	(5.3)	0.0	79.2	N/A	N/A
12/16e	3.7	(40.3)	(5.9)	0.0	78.8	N/A	N/A
12/17e	10.8	(42.6)	(5.2)	0.0	32.1	N/A	N/A
12/18e	48.3	(30.1)	(3.7)	0.0	8.0	N/A	N/A

Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments. All data pro-forma post private placement.

New share issue supports key strategic objectives...

We have increased our estimate of cash burn in 2018 after revising down the expected speed of build-up to 5bn unit capacity during 2018 and 2019. When added to our pre-issue forecast of year-end cash reserves of \$14m, we nevertheless estimate that the \$60m equity issue proceeds net of fees should cover 79% (all but \$21m) of our revised estimate of Thinfilm's \$94m funding requirements to free cash flow break-even in 2019.

...and should diminish investor dilution concerns

While our revised forecasts indicate the requirement for further funding in 2018, we concur with management's assessment that it should be possible for Thinfilm to meet further funding needs from strategic partnerships, customer finance and/or exercise of existing warrants in 2018. As such, based on our current expectations we believe this issue significantly diminishes the likelihood that the company will need to make further equity issues.

Valuation: Dilution hit largely offset by lower WACC

With the above-mentioned changes to our forecast cash flows, arising from our more conservative take on the rate of growth of NFC-enabled label capacity in 2018 and 2019, our DCF valuation has fallen to NOK8.19 per share (from NOK8.58) to reflect the dilutive effect of the equity issue and earnings revisions. The impact of this revision and the 19.8% increase in shares is largely offset in our model by a reduction in the WACC from 15.0% to 14.5%. This reflects what we see as the substantial reduction in the perception of funding and future equity dilution risk that should arise from this placement.

Tech hardware & equipment

21 December 2016

Price **NOK3.78**

Market cap **NOK2,817m**

NOK8.5791/US\$

Net cash (\$m) at 30 September 2016 27.1

Shares in issue (816.8m post issue) 745.2m

Warrants in issue 119.5m

Free float 84.9%

Code THIN

Primary exchange Oslo

Secondary exchange OTCQX

Share price performance



% 1m 3m 12m

Abs (7.4) (6.7) 29.9

Rel (local) (12.5) (17.3) 15.8

52-week high/low NOK5.7 NOK2.4

Business description

Thin Film Electronics commercialises printed electronics and owns key patents for printing rewritable, non-volatile memory and printable NFC circuits. It also licenses technology from others to develop complete printed systems.

Next events

EGM (approximate date) 23 December 2016

Q416 results 24 February 2017

AGM 10 May 2017

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**Thin Film Electronics is a
research client of Edison
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The private placement

Thinfilm announced on 2 December that it had raised NOK529m (\$62.6m) in gross proceeds through a private placement of 135.2m new shares. The subscription price was set at NOK3.91 per share, representing the closing share price on 1 December 2016. The first tranche of 62.6m new shares was issued on 5 December under the authorisation provided at the 10 May 2016 AGM. The issue of the remaining 71.5m shares is subject to approval by an EGM to be held on 23 December, with the issue expected to take place shortly afterwards if it is approved. Management has estimated issue costs at c NOK22m (\$2.6m), resulting in an estimated net cash inflow of NOK507m (\$60.0m).

Forecast revision: EPS boost from lower finance costs

Exhibit 1: Change in earnings forecasts

Amounts in \$m	2015	2016e new	2016e old	Chg (%)	2017e new	2017e old	Chg (%)	2018e new	2018e old	Chg (%)	2019e new	2019e old	Chg (%)
Production													
NFC OpenSense (m units)	0.0	0.8	0.8	0.0	8.0	8.0	0.0	50	466	(89.3)	500	841	(40.5)
NFC SpeedTap (m units)	0.0	0.3	0.3	0.0	12.0	12.0	0.0	150	550	(72.7)	1,500	1,891	(20.7)
EAS labels (m units)	11.2	2.3	2.3	0.0	15.0	15.0	0.0	346	317	9.1	538	502	7.2
Total OpenSense equivalent (OSE) units, m units)	3.2	1.8	1.8	0.0	27.3	27.3	0.0	32	1,130	(71.6)	2,288	3,012	(24.0)
Average unit price/OSE (c)	68.4	68.6	68.6	0.0	31.3	31.4	(0.3)	14.4	13.8	4.3	12.2	11.9	2.7
Sales Revenue	2.2	1.3	1.3	0.0	8.6	8.6	(0.3)	46.3	156.3	(70.4)	279.0	357.7	(22.0)
Total revenue	4.4	3.7	3.7	0.0	10.8	10.8	(0.2)	48.3	158.4	(69.5)	281.1	359.8	
Gross profit	N/A	(1.9)	(1.9)	0.0	1.0	1.0	(0.6)	11.8	48.7	(75.8)	86.1	107.5	(19.9)
Gross profit margin (%)	N/A	neg.	neg.	N/A	8.8	8.8	N/A	24.4	30.7	(20.6)	30.6	29.9	2.5
Payroll	(16.7)	(21.3)	(21.3)	0.0	(23.1)	(23.1)	0.0	(25.1)	(25.1)	0.0	(28.5)	(29.2)	(2.2)
Premises, supplies	(7.6)	(10.4)	(10.4)	0.0	(10.7)	(10.7)	0.0	(3.5)	(7.9)	(55.9)	(7.3)	(8.1)	(10.6)
Total operating costs	(34.7)	(41.4)	(41.4)	0.0	(52.0)	(52.1)	(0.0)	(74.8)	(152.4)	(50.9)	(241.9)	(300.7)	(19.6)
EBITDA	(30.3)	(37.7)	(37.7)	0.0	(41.2)	(41.2)	0.0	(26.5)	6.0	N/A	39.2	59.1	(33.6)
EBITDA margin (%)	neg.	neg.	neg.	N/A	neg.	neg.	N/A	neg.	3.8	N/A	14.0	16.4	N/A
less share-based payments	(1.1)	(1.4)	(1.4)	0.0	(1.6)	(1.6)	0.0	(1.7)	(1.7)	0.0	(1.9)	(2.0)	(2.2)
EBITDA (norm)	(29.2)	(36.3)	(36.3)	0.0	(39.7)	(39.6)	0.0	(24.8)	7.7	N/A	41.1	61.1	(32.6)
D&A	(1.5)	(2.7)	(2.7)	0.0	(3.0)	(3.0)	0.0	(4.8)	(4.8)	0.0	(5.4)	(5.4)	(0.5)
Operating profit	(31.8)	(40.4)	(40.4)	0.0	(44.2)	(44.2)	0.0	(31.3)	1.2	N/A	33.8	53.7	(37.0)
Operating profit (norm)	(30.7)	(39.0)	(39.0)	0.0	(42.7)	(42.7)	0.0	(29.6)	2.9	N/A	35.8	55.6	(35.7)
Finance costs	2.4	(1.2)	(1.2)	0.0	0.1	(1.1)	N/A	(0.5)	(2.3)	(77.8)	(0.5)	(1.2)	(60.9)
Profit before Tax	(29.4)	(41.7)	(41.7)	0.0	(44.2)	(45.3)	(2.5)	(31.8)	(1.1)	2,827.0	33.3	52.4	(36.4)
Profit before Tax (norm)	(28.3)	(40.3)	(40.3)	0.0	(42.6)	(43.7)	(2.6)	(30.1)	0.6	N/A	35.3	54.4	(35.2)
Tax	0.0	(0.3)	(0.3)	0.0	0.0	0.0	N/A	0.0	0.0	N/A	0.0	0.0	N/A
Profit after tax	(29.4)	(42.0)	(42.0)	0.0	(44.2)	(45.3)	(2.5)	(31.8)	(1.1)	2,827.0	33.3	52.4	(36.4)
EPS - (norm) (c)	(5.3)	(5.9)	(6.6)	(9.9)	(5.2)	(6.4)	(18.8)	(3.7)	0.1	N/A	4.3	8.0	(45.9)
EPS - (IFRS) (c)	(5.5)	(6.1)	(6.8)	(9.9)	(5.4)	(6.6)	(18.7)	(3.9)	(0.2)	2,342.2	4.1	7.7	(46.9)
Capex	(4.75)	(6.4)	(6.4)	0.0	(17.0)	(17.0)	0.0	(14.0)	(14.0)	0.0	(2.7)	(3.5)	(22.4)
Cash generation (burn)	(31.4)	(43.6)	(43.6)	0.0	(55.9)	(57.1)	(2.0)	(38.7)	(17.1)	126.7	27.8	51.9	(46.3)
Net cash/(debt)	15.9	74.0	14.1	424.8	18.1	(43.0)	(142.1)	(20.6)	(60.0)	(65.7)	7.2	(8.2)	(188.5)

Source: Thinfilm accounts, Edison Investment Research. Note: Assumes 135.2m share issue raises NOK529m (\$62.6m) by YE16.

We have updated our model to incorporate the share issue, which we have assumed is completed by year-end 2016. The key changes arising from this are reduced debt and debt servicing costs over the next three years and the EPS impact of the 19.8% increase in shares in issue.

We have also updated our operating forecasts with a more conservative take on effective production capacity of NFC labels in 2018 and 2019 (see revised assumptions in Exhibit 1). This is after discussions with management that have led us to adopt a less rapid trajectory in attaining targeted year end production yields during the course of each year. This means that while we have continued to assume the attainment of the guided production capacities of NFC enabled labels of

1.9bn units at year end 2018 and 5.0bn units at year end 2019, our estimate of total production attainable within each year, with lower average production yields, has fallen from just over 1.0bn units in 2018 to 200m units and from 2.7bn units in 2019 to 2.0bn units. Following on from end 2019 our production capacity forecasts are unchanged. This means that we continue to assume the attainment of management's targeted capacity of 5.0bn NFC labels at end 2019 based on the achievement of management's targeted levels of production yields at end 2019, and we continue to expect further capacity increases in following years arising from reductions in die sizes and/or debottlenecking. We have also increased the proportion of sales of NFC SpeedTap relative to NFC OpenSense from 2017 to reflect particularly strong recent interest in the NFC SpeedTap over the last six months from high-volume producers/packagegers. This reflects its expected lower price and suitability for a wide range of FMCG products, which supports the case for this becoming a very high volume seller for Thinfilm.

In an unrelated exercise, we have also narrowed the price difference between the two products, with a 10% deviation on each side of this figure rather than the previous 20%, but maintain an average price of 13.6c in 2018, as per management guidance. The effect of this shift in sales towards relative lower priced SpeedTap from 2020 has a negative impact on revenues and profits until late in our forecast period when the bulk of SpeedTap production is assumed to be farmed out for sale under licence, leaving only higher-margin NFC SpeedTap using the in-house production facilities.

Valuation

Exhibit 2: Thinfilm DCF valuation summary											
\$m	2016e	2017e	2018e	2019e	2020e	2021e	2022e	2023e	2024e	2025e	2026e
Revenue by product line											
Brand protection	0.0	2.2	3.2	4.5	6.3	6.7	7.1	7.4	9.8	13.0	17.4
Electronic Article Surveillance	0.1	0.6	11.5	17.5	35.6	47.1	46.7	46.0	46.4	46.8	47.2
NFC OpenSense	0.2	1.9	7.5	69.7	143.0	207.9	302.3	439.4	439.4	414.2	386.5
NFC SpeedTap	0.1	2.2	18.4	171.0	373.7	313.5	211.2	100.2	117.3	117.0	163.8
Sensor labels	0.0	0.8	0.9	1.4	4.0	3.8	3.6	3.3	3.2	3.1	3.0
NFC Smart sensor labels	0.0	-	3.9	13.8	45.9	47.8	47.8	80.0	91.2	93.6	95.0
Other	0.8	0.8	0.9	1.2	1.3	1.4	1.6	1.7	1.9	2.2	2.4
Sales revenue	1.3	8.6	46.3	279.0	609.7	628.2	620.2	678.1	709.3	690.0	715.4
Total unit sales own production (m)	3	36	557	2,580	5,897	6,389	6,234	6,249	6,096	6,023	5,944
NFC OpenSense price (c/unit)	27.0	23.6	15.0	13.9	13.0	12.1	11.2	10.5	9.9	9.5	8.9
ASP own production (c/unit)	12.8	15.2	7.6	10.6	10.2	9.4	9.0	9.5	9.3	8.9	8.5
Share units produced in-house (%)	75.8	2.3	19.0	26.5	31.5	32.9	31.7	31.7	23.9	18.8	14.6
Average licence fee/price (%)	12.0	11.1	10.3	9.4	8.6	7.7	6.9	6.0	6.0	6.0	6.0
Production revenue	0.4	5.5	42.1	273.3	600.8	597.6	562.7	592.2	565.0	536.7	504.9
License revenue	0.0	2.2	3.2	4.5	7.6	29.2	55.9	84.2	142.4	151.1	208.0
Other revenue	3.3	3.1	3.0	3.3	3.4	3.6	3.7	3.9	4.1	4.4	4.7
Total revenue	3.7	10.8	48.3	281.1	611.8	630.3	622.4	680.3	711.5	692.2	717.6
Growth (%)		192.6	346.4	481.6	117.7	3.0	(1.3)	9.3	4.6	(2.7)	3.7
Gross margin (%)	N/A	N/A	20.4	29.9	32.7	31.9	31.1	30.8	28.9	28.7	26.5
EBITDA	(37.7)	(41.2)	(26.5)	39.2	139.5	152.9	163.5	195.6	228.1	223.1	252.7
EBITDA Margin (%)	(1,018.3)	(380.8)	(54.8)	14.0	22.8	24.3	26.3	28.8	32.1	32.2	35.2
Depreciation	(2.7)	(3.0)	(4.8)	(5.4)	(4.0)	(4.2)	(4.4)	(4.6)	(4.7)	(4.8)	(4.9)
EBIT	(40.4)	(44.2)	(31.3)	33.8	135.5	148.7	159.1	191.1	223.3	218.3	247.8
Notional tax	0.0	0.0	0.0	0.0	0.0	(37.2)	(39.8)	(47.8)	(55.8)	(54.6)	(62.0)
Tax rate (%)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
EBITDA after tax	(37.7)	(41.2)	(26.5)	39.2	139.5	115.7	123.7	147.9	172.2	168.5	190.7
Change in working capital	(0.2)	.7	.6	(10.1)	(17.1)	(1.7)	(1.7)	(5.7)	(5.3)	.9	(5.1)
Capex	(6.4)	(17.0)	(14.0)	(2.7)	(6.0)	(6.0)	(5.6)	(5.9)	(5.6)	(5.4)	(5.0)
Capex/revenue (%)	173.7	157.1	29.0	1.0	1.0	.9	.9	.9	.8	.8	.7
Free cashflow	(44.3)	(57.6)	(39.9)	26.4	116.4	108.1	116.4	136.2	161.3	164.0	180.5
Terminal value											1,570
NPV of future cash flows	(44.3)	(50.3)	(30.4)	17.6	67.7	54.9	51.7	52.8	54.6	48.5	452.0
Value of future cash flows	675		WACC		14.5%						
Net debt/(cash) pro forma 31/12/15	(118)		Terminal growth rate		3%						
Equity value	792		TV as % of total EV		51.2						
Per share value (NOK)	8.19		US\$/NOK		8.4444						

Source: Edison Investment Research. Note: FX rate as at 12 December 2016.

We have revised our DCF calculation to take account of the private placing, which has resulted in a 5% reduction in DCF per share from NOK8.58 to NOK8.19. The key contributory changes are:

- As discussed above, we have reduced our revenue estimates on shifts in product mix, which reduces our average revenues and EBITDA by 4.9% and 1.6%, respectively, between 2020 and 2026, reflecting the positive margin impact of the increase in prices of NFC SpeedTap.
- A reduction in WACC by 0.5 percentage points to 14.5%. This reflects the much lower funding and equity dilution risk that we believe the market will factor into Thinfilm's cost of capital as a result of the equity raising.
- An increased pro forma year-end 2015 net cash balance, from \$58m to \$118m, to reflect the receipt of the NOK529m (\$60.0m) equity issue net of NOK22m (\$2.6m) estimated costs.
- An increase in the number of shares in issue of 135.2m (19.8%), from 681.6m to 816.8m.
- A 2.5% strengthening in the US dollar vs the Norwegian krone since our last valuation update, which has a positive impact on the Norwegian krone valuation given the calculation of cash flows in dollars.

For full discussion of our DCF assumptions, see our recent note [Bringing it all together in 2018](#), published 21 November 2016.

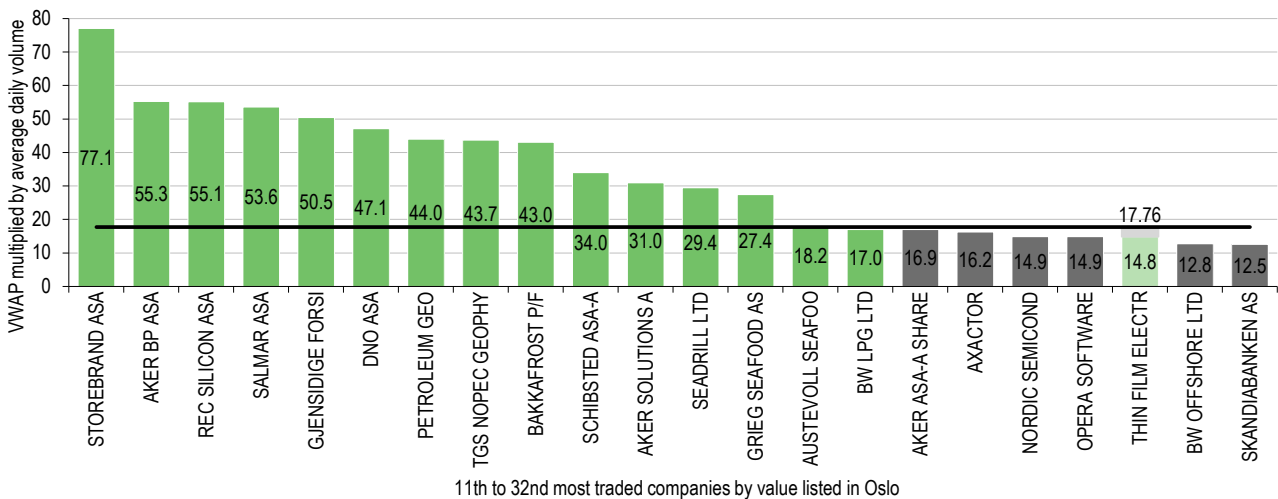
Potential for inclusion in the OBX Index

We believe that the current increase in shares in issue may have a positive impact on trading volumes on the Oslo Børs in coming years and therefore Thinfilm's prospects of being included in the Oslo Børs's tradable OBX Index. This comprises the 25 most highly traded stocks on the Oslo Børs, and is rebalanced every June and December. Inclusion is based purely on trading volumes.

Data for the last six months show Thinfilm ranked 30th in terms of trading on the Oslo Stock Exchange (see Exhibit 2) based on its average daily volume of NOK14.8m. It would have reached the same volume as the lowest volume stock currently included in the index with a 14.9% increase in trading volume.

We would exercise caution on assuming that trading volumes will be boosted sufficiently to bring Thinfilm into the bounds of index eligibility by the next rebalancing in June 2017. Although Thinfilm has not yet released the breakdown of the participants to the private placement, we see the potential for them to be dominated by larger, long-term investors, which would affect the influence of the increased outstanding share balance on trading volumes in the near term.

Exhibit 2: Stocks ranked 11 to 32 in terms of average daily trading volume on Oslo Børs (six months to 5 December 2016) – impact of potential 20% increase in Thinfilm trading volume



Source: Bloomberg. Note: The stocks qualifying for 30 highest volume tally are shown in green. Volumes calculated as volume weighted average daily price (VVAP) multiplied by shares traded. The light grey bar on Thinfilm's volume bar indicates the effect of a 20% increase in trading volumes. The black line shows the potential change in ranking from such an increase.

Exhibit 3: Financial summary

	US\$000s	2014	2015	2016e	2017e	2018e
Year end 31 December		IFRS	IFRS	IFRS	IFRS	IFRS
PROFIT & LOSS						
Revenue		4,479	4,413	3,699	10,824	48,325
EBITDA (norm)		(23,550)	(29,187)	(36,295)	(39,650)	(24,769)
Operating Profit (norm, before amort. and except.)		(24,855)	(30,724)	(39,041)	(42,671)	(29,585)
Intangible Amortisation		0	0	0	0	0
Exceptionals		0	0	0	0	0
Share-based payments		(941)	(1,064)	(1,372)	(1,572)	(1,706)
Operating Profit		(25,796)	(31,788)	(40,413)	(44,243)	(31,291)
Net Interest		701	2,406	(1,249)	83	(507)
Profit Before Tax (norm)		(24,155)	(28,318)	(40,290)	(42,588)	(30,092)
Profit Before Tax (FRS 3)		(25,096)	(29,382)	(41,662)	(44,160)	(31,798)
Tax		0	0	(303)	0	0
Profit After Tax (norm)		(24,155)	(28,318)	(40,593)	(42,588)	(30,092)
Profit After Tax (FRS 3)		(25,096)	(29,382)	(41,965)	(44,160)	(31,798)
Average Number of Shares Outstanding (m)		493.5	535.4	686.1	816.8	816.8
EPS - normalised (c)		(4.9)	(5.3)	(5.9)	(5.2)	(3.7)
EPS - (IFRS) (c)		(5.1)	(5.5)	(6.1)	(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	14,630	28,609	37,793
Intangible Assets		2,319	2,602	2,828	2,828	2,828
Tangible Assets		4,870	7,788	11,802	25,781	34,965
Investments		0	0	0	0	0
Current Assets		33,870	19,425	77,586	22,336	9,939
Stocks		451	367	799	1,281	297
Debtors		2,565	3,118	2,787	2,966	9,268
Cash		30,854	15,940	74,000	18,089	374
Other		0	0	0	0	0
Current Liabilities		(4,748)	(5,170)	(5,100)	(6,417)	(33,296)
Creditors		(4,748)	(5,170)	(5,100)	(6,417)	(12,296)
Short term borrowings		0	0	0	0	(21,000)
Long Term Liabilities		0	0	0	0	0
Long term borrowings		0	0	0	0	0
Other long term liabilities		0	0	0	0	0
Net Assets		36,311	24,645	87,116	44,528	14,436
CASH FLOW						
Operating Cash Flow		(24,079)	(26,036)	(36,466)	(38,994)	(24,208)
Net Interest		569	146	119	83	(507)
Tax		0	0	(303)	0	0
Capex		(3,217)	(4,751)	(6,426)	(17,000)	(14,000)
Acquisitions/disposals		(2,700)	(799)	(560)	0	0
Financing		16,477	16,527	101,696	0	0
Dividends		0	0	0	0	0
Net Cash Flow		(12,949)	(14,914)	58,060	(55,911)	(38,714)
Opening net debt/(cash)		(43,803)	(30,854)	(15,940)	(74,000)	(18,089)
HP finance leases initiated		0	0	0	0	0
Other		0	0	0	0	0
Closing net debt/(cash)		(30,854)	(15,940)	(74,000)	(18,089)	20,626

Source: Thinfilm accounts, Edison Investment Research. Note: Assumes issue of 135.2m shares to raise NOK529m (\$62.6m) by year end 2016.

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