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ShadowFall Capital & Research

2 February 2018

Dear Investors,

The Fund has made a positive start to the New Year. Amongst a number of candidates on the short side, our attention has been drawn to one in particular, IQE Plc.

The headline performance of IQE portrays a company whose valuation (despite the recent sell-off) we struggle to understand. We conclude that at its current valuation that the market is pricing in stellar growth on the horizon. However, with what appear to be sizable competitive pressures developing within the wafer industry, in our view, stellar growth seems increasingly unlikely. We believe that these factors alone warrant the Fund's opening of a short. But, as the saying goes: "study the past if you would define the future[1]", and when we dig deeper into IQE's recent past, we discover a range of accounting features, which increase our incredulity further. More specifically, our concerns centre on the Group's two JVs and a series of related party transactions that appear to us to be somewhat circular.

Without these apparent related party transactions, it is our view that IQE's historically poor cash generation, or lack thereof, would have continued during 2015 and 2016. More recently, 2017's modest reduction in related party revenue and corresponding decline in consensus forecast cash generation[2], only accentuates our view as to how vital related parties are to IQE's "story".

Our findings beg the question whether IQE's recent financiers were aware as to how reliant IQE appears to be upon its related party transactions prior to providing IQE with such significant additional capital?

When combined with our understanding of the competitive outlook for the wafer industry, together with our review of IQE's accounting features, our research has led us to the point where we have serious concerns about IQE's governance, its reported profitability and its sources of cash, so that we believe that IQE is worth significantly less than its current c. £890 million valuation[3].

So as to provide to you an example of our reasoning, our analysis of IQE's accounting is now provided in more detail in this letter below.

In the meantime, we look forward to updating you anon.

Regards,

ShadowFall

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[1] Confucius.

[2] According to Bloomberg, IQE's consensus 2017 Free Cash Flow forecast has declined from a positive FCF forecast of £16.7 million as predicted in March 2017, to a current negative FCF forecast of a c. £1 million.

[3] Enterprise Value. Bloomberg source at time of writing.

IQE Plc: A tale of two JVs

IQE is an AIM listed company, valued at c. £890 million. It describes itself as the global leader in the design and manufacture of advanced semiconductor wafer products, with its products being used to produce the high performance components that enable a wide range of high-tech applications.

From FY2009 to H1 2017, IQE has:

- Reported a cumulative £180.0 million in EBITDA.
- Generated a cumulative £12.7 million in Free Cash Flow[4].
- Paid no dividends.
- Spent a cumulative £59 million on acquisitions.
- Raised around £166 million in capital; c. £147 million in equity issuance and c. £19 million in net debt issuance. This includes a recent gross £95 million equity raise on 10 November 2017.
- Prior to its recent equity raise, seen its net debt steadily rise.

Figure 1 IQE's incorporation of its JVs
Source: Bloomberg, IQE annual filings

[4] The company's reported Free Cash Flow stated in its annual filings from 2009 to 2016 is a cumulative total of £17.8 million. We estimate that in H1 2017 the group achieved a £5.1 million Free Cash Outflow. IQE defines its reported Free Cash Flow as net cash flow before acquisitions, financing and net interest paid. Our estimate for H1 2017 is derived using IQE's definition. In H1 2017 the group reported £11.195 million cash inflow from operations, (£0.946 million) cash outflow on tax, (£9.604 million) cash outflow on investment in intangible fixed assets, and a (£5.763 million) cash outflow on purchase of PPE. Hence, H1 2017 reported Free Cash Outflow equals (£5.1 million) and therefore, cumulative Free Cash Flow since 2009 is estimated to be £12.7 million. The fact that in its FY2017 Pre-close update, IQE reported that net funds would be in the range of current market expectations, despite full year revenues being ahead of market expectations, suggests to us that its cash generation showed little improvement in H2 2017.

Summary of Findings

- In 2014, IQE incorporated two companies that subsequently became JVs.
- **These JVs made significant contributions to IQE's profitability in 2015 and 2016.**
  The JVs contributed:
    - £8.0 million or 42% to 2015 adjusted EBIT.
    - £6.6 million or 30% to 2016 adjusted EBIT.
- On an EV/EBIT basis, IQE trades on c. 42 x its 2016 EBIT.

Forty-two times the JVs' 2016 profit would suggest that the market is attaching approximately £278 million in value relating to the profit generated by these JVs.

- While IQE has reported significant profits from these JVs, by contrast **the JVs have reported significant and growing losses.**
  The JVs reported combined losses of:
    - c. £1.9 million in 2015; rising to
    - c. £6.3 million in 2016.
- IQE has reported a cumulative £180.0 million in EBITDA during 2009 to H1 2017.
- IQE has reported a cumulative £12.7 million in Free Cash Flow since 2009[5].
- We estimate that the JVs contributed:
    - £7.7 million towards (or 74% of) IQE's Free Cash Flow in 2015; and
    - £7.0 million towards IQE's Free Cash Flow in 2016.
- **Without the JVs' cash contribution in 2016, we estimate that IQE would have reported negative FCF in 2016.**

Whereas the JVs purchase from IQE, and IQE purchases from the JVs, aside from IQE, it is not altogether clear that these JVs have any other customers. It is a somewhat circular state of affairs.

On the basis of:

- The joint control of these JVs;
- The apparent lack of any other customers for these JVs, other than IQE;
- The seemingly one way benefit to IQE from this relationship, where IQE books the profits and the JVs retain the losses;
- The cash flows from the JVs to IQE, that appear to have markedly improved IQE's FCF; and
- The fact that when licence revenues from these JVs declined in 2017, there appears to have been lacklustre FCF in 2017, mitigated by a sizeable capital raise.

We have serious concerns about IQE's governance, its reported profitability and sources of cash.

[5] See note 2.

Further Findings

The Singaporean JV's relationship with MBE Technology

- In 2013, IQE's Singaporean subsidiary, MBE Technology, reported a precipitous fall in revenue; a c. £11.5 million decline, down 63% compared to 2012. It is unclear to us, why this revenue declined nor where this was represented in the group's annual filings[6].
- Also in 2013, MBE Technology wrote down £9.7 million in PPE value. Again it is unclear to us, why it was written down nor where this was represented in the group's annual filings[7].
- By 2015, of the legacy revenue that remained with MBE Technology, all of this revenue was attributable to sales and licensing of IP to IQE's newly formed Singaporean JV, CSDC Private Limited. In a somewhat circular fashion, all of MBE Technology's costs were related to purchases from IQE's Singaporean JV, CSDC Private Limited. It would seem to us that:
    - MBE Technology appears to have 1 customer: CSDC Private Limited;
    - CSDC Private Limited appears to have 1 customer: MBE Technology.
- When comparing the 2016 annual filings of both MBE Technology and its JV, CSDC Private Limited, we are unable to reconcile elements of the accounts to each other. For example, when comparing each company's trade receivables and payables that are due to each other, there appears to be an irreconcilable £2.1 million in Singapore.

The UK JV's relationship with IQE group companies

- IQE group companies reportedly contributed equipment with a market value of £12 million to the UK JV, Compound Semiconductor Centre Limited. However, this equipment appears to have been marked up in value by a factor of 4.7x from its net book value (NBV) when originally held at IQE group companies prior to its transfer; this resulted in a profit gain on disposal to IQE of £4.8 million.
- In return for the transfer of this equipment (that was seemingly marked up in value), IQE received equity. Somewhat bizarrely this equity value was then swiftly written-off.
- The UK JV also made net cash purchases of £7.8 million for tangible assets during 2015 and 2016. It is unclear to us from whom these tangible assets were purchased.
- At one point in 2016, the UK JV even loaned IQE group companies £5.2 million.
- The UK JV spent £23.2 million in cash through operating and investing outflows in 2015 and 2016. Just £3.6 million of this related to staff costs. We estimate that ***at least*** £12.0 million of this has been directed towards IQE group companies.

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[6] We note the JVs, the wholly-owned subsidiaries and the group, each report annual filings for year ended 31 December.

[7] The group "booked provisions of £4.9m for asset impairment comprising the transfer of tools to the newly formed CSDC" JV in 2014. However:

1. The MBE Technology write-down related to the year end 31 December 2013.
2. The CSDC JV wasn't even incorporated until 21 May 2014.
3. Even if this £4.9m impairment did relate to MBE Technology, it was for £4.9m and not what seems to have been a £9.7m impairment at the subsidiary level.

Some background reading for our investors

We find that reviewing the intricacies of off-balance sheet accounting generally provides for noteworthy observations. A recent example is Globo Plc. Around three years ago, the author of this letter highlighted Globo's off-balance sheet accounting in action[8]. Globo was a Greek software company, listed on the UK's AIM market, and it provided a clear example of off-balance sheet accounting through the so-called, Pig and Pork Scheme.

The Pig and Pork Scheme

For those unfamiliar with 'Pig and Pork' it is the process whereby a company, Pig Ltd, buys from another company, Pork Ltd, apparently at arm's length when in fact there is an undisclosed or unclear common ownership of both companies. The result is that profits emerge in Pork Ltd so that having been duped into believing that Pork Ltd is profitable, Pork Ltd's financiers are prepared to provide Pork Ltd further financing. Pork Ltd's auditors cannot systematically pick it up; especially if Pig Ltd and Pork Ltd appoint a separate audit firm. The only financial cure for both companies is that Pig Ltd ultimately disposes of that which it has purchased at a profit after covering the warehousing costs incurred. Needless to add, this cure is not usually to hand in time. The practice is woeful.

In Globo's case, it divested a subsidiary company, Globo Technologies (GT), selling a 51% share in GT to its management, with Globo retaining a 49% interest in GT. Thereafter, GT was held on Globo's balance sheet as an "Investment in an Associate", and it would appear GT went about purchasing goods and services from Globo, owing Globo increasing amounts of cash. **Globo's revenues and profits grew steadily, <u>although the issue of weaker than expected cash flow persisted</u>.**

Unfortunately for Globo, its associate, GT, could not dispose of the goods and services it had purchased from Globo. Less than 18 months later, Globo's management confessed to the "Falsification of data and misrepresentation of the Company's financial situation.[9]" Weeks later the Greek software company was insolvent. As mentioned above, the cure is not usually to hand in time. Globo's practices were shocking.

[8] www.lordshipstrading.com/2014/07/the-pig-and-pork-scam.html - the author of this letter is also the author of the fore mentioned website.

[9] www.investegate.co.uk/globo-plc--gbo-/rns/company-statement/201510260819113872D/

IQE: 2014 – a notable year – the incorporation of the JVs

2014 was a noteworthy year for IQE. Following a disappointing set of H1 2014 interim results (released 16 September 2014), IQE's share price marked its lowest level since 2009. The shares fell by 38% from the interims to a low of 12.5p (on 13 October 2014). A few weeks later (on 10 October 2014), IQE's CEO, Dr Drew Nelson, entered into a somewhat esoteric equity sale and repurchase arrangement with Equities First Holdings LLC (EFH). This arrangement saw IQE's CEO pledge 18 million shares to raise £1.865 million, at what was a significant discount to the already diminished equity value at the time[10]. The rationale for this arrangement was subsequently disclosed as the IQE's directors electing to take up option rights, and thereby requiring cash to satisfy income tax and national insurance contributions. IQE highlighted that collectively the directors increased their IQE holdings from 31,183,717 shares, to 43,025,540 post the option exercise and purchases. An increase of 11,841,823.

Also in 2014, IQE incorporated two companies that would go on to become joint ventures and seemingly, significantly contribute to both IQE's bottom line and cash flow:

- **CSDC Private Limited**, incorporated in Singapore on 21 May 2014; and
- **Compound Semiconductor Centre Limited**, incorporated in the UK on 9 September 2014.

2014 was an eventful year.

Two subsidiaries were created which became JVs.

The market took a disappointing view of IQE's H1 2014 interims.

An esoteric equity sale and repurchase agreement was entered into by IQE's CEO.

Figure 2 IQE share price and notable events of 2014
Source: Bloomberg

[10] This would suggest that the shares were pledged at a value of 10.3p/shr. In the weeks leading up to this arrangement with EFH, the shares reached an intra-day low of 12.3p/shr on the 10th of October 2014 (the day of the pledge) and averaged 15.5p in the period from the interims announcement until the EFH equity loan. I.e. it would appear that the stock was pledged at a rate of 84% of the intra-day low or at a rate of 66% of the average share price in the day's leading up to the arrangement.

These JVs have made a significant contribution to IQE's profitability.

IQE trades on a 42 times multiple of 2016 EBIT.

The JVs contributed £6.6m (30%) to 2016 adjusted EBIT.

Does this mean £278 million in value is assigned to these JVs?

Figure 3 IQE's share price since. The JVs accounted for 30% of adjusted EBIT in 2016.
Source: Bloomberg

The importance of the two JVs

As illustrated in figure 4 below, the JVs contributed £8.0 million, or 42%, to the group's reported full year adjusted operating profit of £19.0 million in 2015. Without this contribution the group's adjusted operating profit would have in fact fallen by 38%, to £11.0 million compared to 2014.

In 2015 and 2016, the JVs contributed a great deal to IQE's profitability.

The JVs:

- **Contributed £8.0 million to and comprised 42% of adjusted EBIT in 2015.**
- **Contributed £6.6 million to and comprised 30% of adjusted EBIT in 2016.**

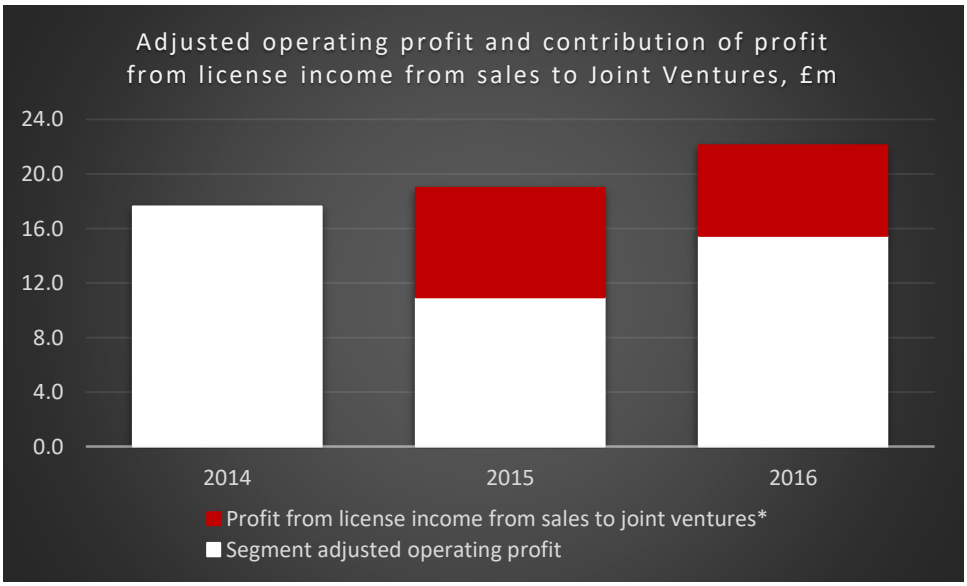

*Figure 4 IQE's adjusted operating profit and contribution from its JVs: CSDC Private Limited (Singapore) and Compound Semiconductor Centre Limited. *IQE states: "The profit arising from license income sales to joint ventures in 2015 represents revenue of £15,310,000 offset by an elimination of unrealised profit of £7,286,000 relating to our retained interest in the Compound Semiconductor Centre Limited joint venture. No such elimination has occurred in 2016."*
Source: IQE annual filings

In 2016, the JVs contributed £6.6 million, or 30%, to the group's reported full year adjusted operating profit of £22.1 million. Without this contribution, adjusted operating profit would have risen compared to 2015's performance, however would still be 12% below 2014's performance, at £15.5 million.

IQE's profit gain compared to the JVs' loss

As far as we are able to determine, what is IQE's gain is its JVs' loss. While IQE has achieved profits from license income sales to these JVs, concurrently the JVs have accumulated increasing losses.

This might not be much of a concern, however, when reviewing the accounts[11] of these JVs we find that these JVs have a somewhat circular relationship with wholly-owned IQE subsidiary companies. Essentially, wholly-owned IQE subsidiary companies sell goods, services and IP to the JVs and the JVs sell goods and services back to those wholly-owned IQE subsidiary companies. As a result of this relationship, IQE receives a significant[12] profit while the JVs receive mounting losses. Further, aside from IQE's wholly-owned subsidiary companies it, is not altogether apparent to us whether these JVs have any other customers. In the light of this, we question the quality of IQE's earnings.

Meanwhile, in 2015 and 2016, the JVs reported growing losses.

The JVs:

- **Reported combined losses of c. £1.9 million in 2015.**
- **This grew to combined losses of c. £6.3 million in 2016.**

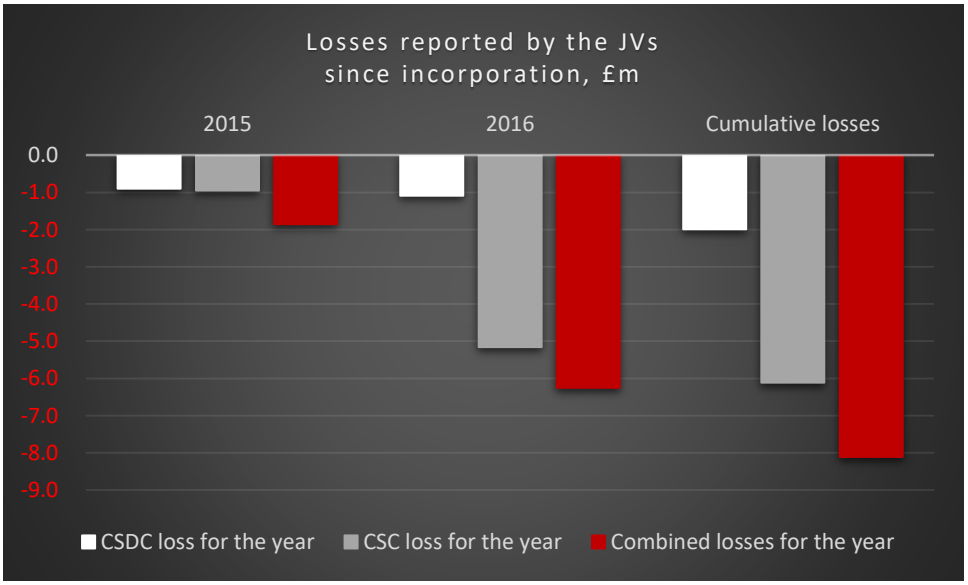

Figure 5 Losses held by IQE's JVs: CSDC Private Limited (Singapore) and Compound Semiconductor Centre Limited. For the GBP Value of Singaporean losses we have used FX rates as detailed in figure 29
Source: CSDC Private Limited & Compound Semiconductor Centre Limited annual filings

[11] The accounts were obtained from UK Companies House and Singapore's Accounting and Corporate Regulatory Authority (ACRA).
[12] In relation to the Group's other profit sources – see figure 3.

Then there is the cash flow

Since 2008, IQE's EBITDA has steadily risen; to £31.7 million in FY2016. During the same period, IQE's free cash flow generation has been what some might view as rather lacklustre.

IQE's EBITDA has steadily risen since 2008.

Free Cash Flow generation has been less consistent.

EBITDA was £31.7 million in 2016.

This compares to reported FCF of £2.6 million in 2016.

Does this include the benefit of transactions with the JVs?

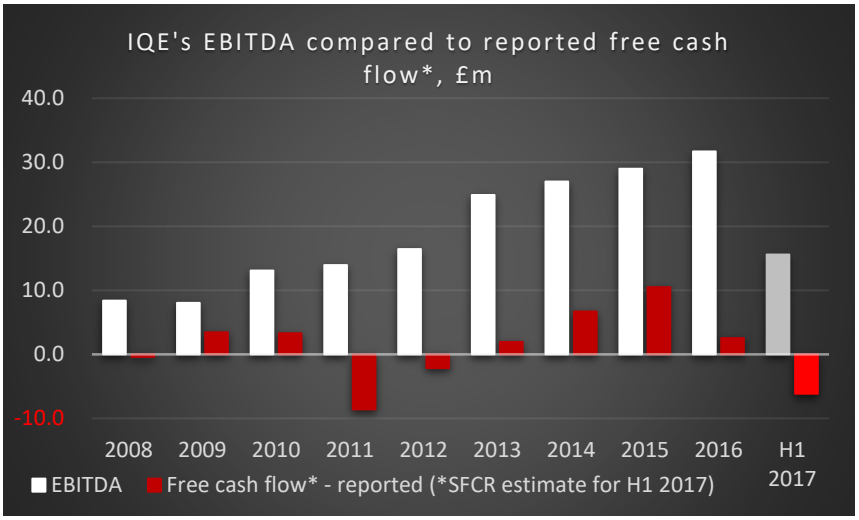

Figure 6 IQE's reported EBITDA as compared to its reported Free Cash Flow
Source: IQE annual filings and interim reports. Note: H1 2017's FCF is estimated by ShadowFall, in line with IQE's own definition of reported Free Cash Flow.

On a cumulative basis, the lacklustre record of free cash flow generation compared to reported EBITDA appears even starker still. For example, since 2009, IQE has reported cumulative EBITDA of £180.0 million. This compares to cumulative Free Cash Flow of £12.7 million[13].

On a cumulative basis, since 2009, the record of reported EBITDA stands tall as compared to the cumulative Free Cash Flow generation.

Cumulative EBITDA has been £180.0 million since 2009.

Cumulative Free Cash Flow over the same period has been less strong.

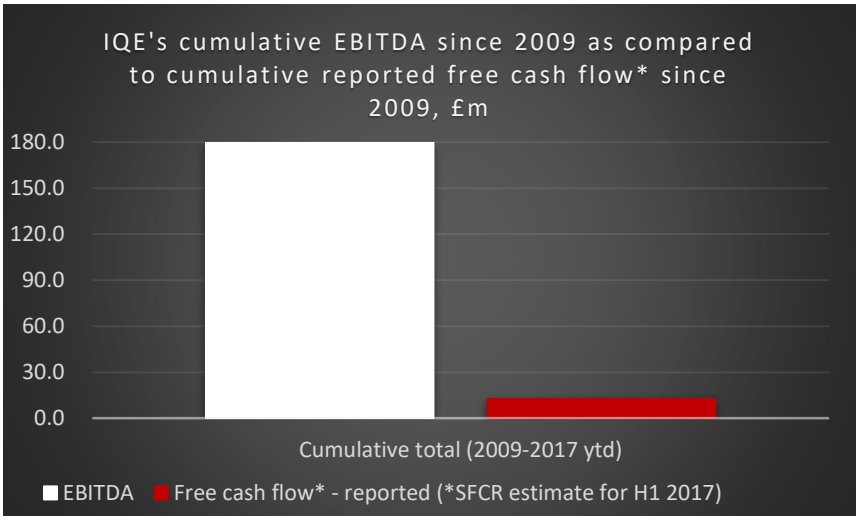

Figure 7 IQE's cumulative EBITDA as compared to its cumulative reported Free Cash Flow since 2009
Source: IQE annual filings and interim reports. Note: H1 2017's FCF is estimated by ShadowFall, in line with IQE's own definition of reported Free Cash Flow.

[13] The company's reported Free Cash Flow from 2009 to 2016 is a cumulative total of £17.8 million. In line with IQE's own definition of Free Cash Flow, we estimate that in H1 2017 the group achieved a £5.1 million Free Cash Outflow. Hence, cumulative Free Cash Flow since 2009 is estimated to be £12.7 million.

Since 2009, IQE has raised c. £166.2 million in capital; £19.4 million in net debt and c. £146.8 million in share issuance.

Since 2009, we estimate that IQE has generated £168.2 million more in EBITDA than cumulative Free Cash Flow.

During the same period the company has raised c. £166.2 million in capital.

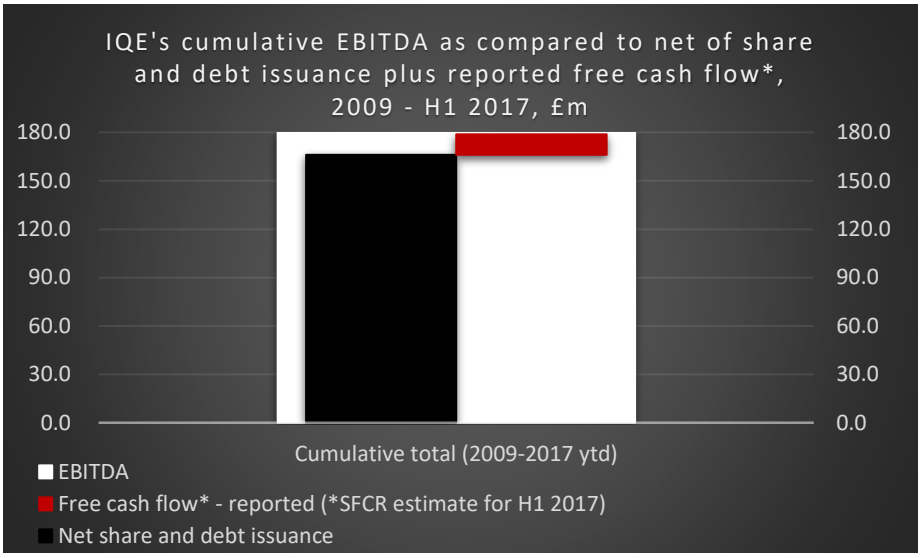

Figure 8 IQE's EBITDA as compared to its reported Free Cash Flow and net debt and share issuance: cumulative since 2009
Source: IQE annual filings and interim reports. Note: H1 2017's FCF is estimated by ShadowFall, in line with IQE's own definition of reported Free Cash Flow.

However, as well as profits, the JVs contributed cash

According to the filings of the Compound Semiconductor Centre Limited JV, IQE group companies benefited from £7.7 million in net cash flows to IQE group companies from the JV in 2015. In 2016, the net cash flows from the CSC JV to IQE group companies appear to total £7.0 million[14].

Estimated net cash flows received by IQE group companies from the CSC JV are estimated to be £7.7 million in 2015 and £7.0 million in 2016.

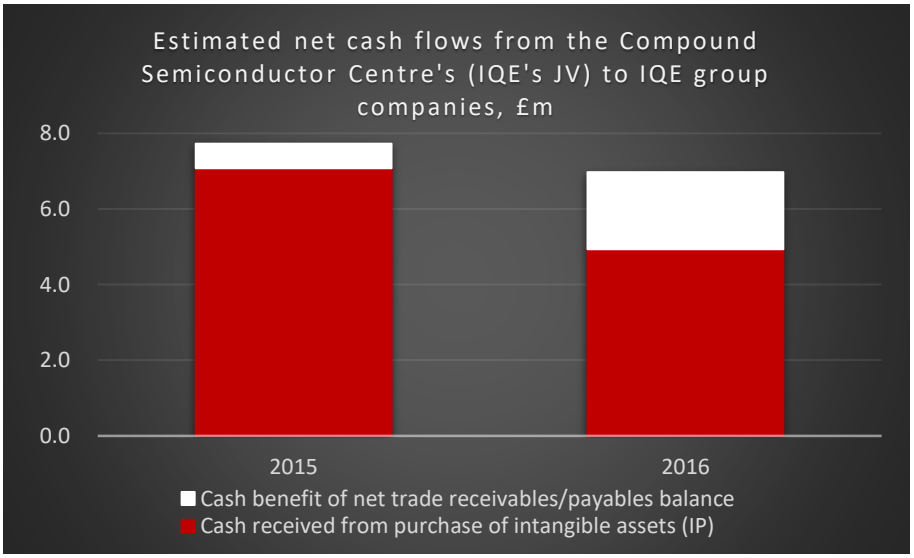

Figure 9 Estimated net cash flows from purchase of IP and benefit of net trade receivables/payables balance to IQE group companies from the CSC JV, from 2015-2016, £m
Source: Compound Semiconductor Centre Limited's annual filings

[14] We assume that the cash received by the wholly-owned group companies was reflected in the consolidated accounts.

It appears that this net cash flow received by IQE group companies had a significant impact on IQE's Free Cash Flow in 2015 and 2016. Without the cash received from the CSC JV, we estimate that IQE's FCF in 2015 would be reduced from a reported £10.5 million to £2.8 million. On the same basis, IQE's reported FCF would have been reduced from £2.6 million, to a **Free Cash Outflow** of £4.4 million.

These estimated net cash flows received by IQE group companies from the CSC JV appear to have made a significant contribution to IQE's FCF in 2015 and 2016.

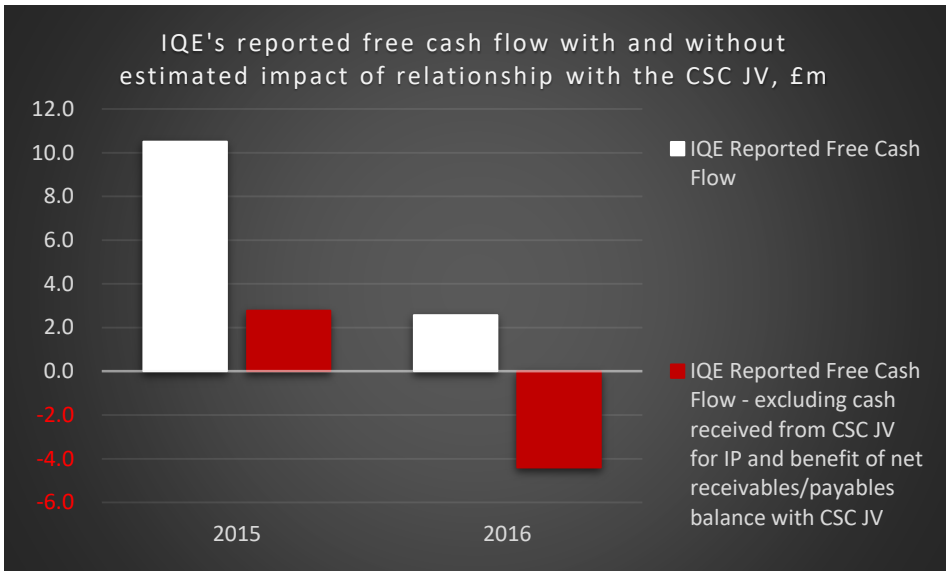

Figure 10 Estimated impact on IQE group FCF from net cash flows from purchase of IP and benefit of net trade receivables/payables balance to IQE group companies from the CSC JV, from 2015-2016, £m
Source: Compound Semiconductor Centre Limited's annual filings

We further note that:

1. The Compound Semiconductor Centre JV has had £23.2 million in capital injected into it over 2015 and 2016; £20.9 million in equity and £1.1 million in debt proceeds. By contrast, CSC has reported a cumulative Free Cash Outflow of £23.2 million during 2015 and 2016. CSC's staff costs were £3.6 million over this two year period. CSC purchased IP from IQE of which £12.0 million was paid for in cash to IQE during this period. A further £7.8 million in cash was paid by CSC for tangible assets during 2015 to 2016. It is not clear to us who sold these tangible assets to CSC, however, later on we highlight the asset disposals made by IQE companies to its JVs.

2. **At one point, the Compound Semiconductor Centre JV even loaned IQE group companies £5.2 million during 2016**. Although this was reported to have been repaid in full during 2016.

Compound Semiconductor Centre Limited Registered number: 09210371

Notes to the financial statements for the year ended 31 December 2016 (continued)

20 Related Party Transactions

IQE plc group companies own 50% of Compound Semiconductor Centre Limited (the "Company") with the remaining 50% owned by Cardiff University. In establishing the joint venture, IQE contributed equipment with a market value of £12,000,000, which was matched by a £12,000,000 cash contribution from Cardiff University.

This equipment appears to have had an NBV of £2.6m and was marked up in value.

Subsequent to the formation of the Joint venture the Company purchased £20,000,000 of Intellectual property from the IQE plc Group in return for 8,000,000 of A preference shares and £12,000,000 of cash.

While the equipment transfer appears to have been marked up resulting in a gain on disposal to IQE, somewhat oddly, the equity received appears to have been swiftly impaired.

During 2015 the Company issued 5,651 B preference shares to Cardiff University in return for cash of £5,651,000. During 2016 an additional 3,249 B preference shares were issued to Cardiff University in return for cash of £3,249,000.

During the year the Company made sales of £3,955,000 (2015: £1,521,000), other recharges of £4,877,000 (2015: £nil) and sold plant and machinery of £898,000 (2015: £nil) to IQE plc group companies.

Sales and recharges in, recharges of costs out.

During the year the Company incurred recharges of costs of £6,218,000 (2015: £145,832) from IQE plc group companies.

The Compound Semiconductor Centre Limited has trade receivables of £4,093,000 (2015: £1,104,000) due from IQE plc group companies and £nil (2015: £nil) due from Cardiff University.

The Compound Semiconductor Centre Limited has trade payables of £2,054,000 (2015: £446,000) due to IQE plc group companies and £nil (2015: £nil) due to Cardiff University.

IQE group companies appear to benefit from a £2.0m cash balance from the receivables and payables balance with the CSC JV in 2016.

The Compound Semiconductor Centre Limited loaned IQE plc group companies £5,200,000 at an interest rate of 2.05% during the year. The loan and accrued interest were repaid in full during the year.

At one point the CSC JV loaned IQE group companies £5.2m in 2016.

In addition as at the year end the Compound Semiconductor Centre Limited has the following amounts payable to shareholders:

- IQE plc group companies - £8,000,000 (2015: £8,000,000) relating to Preferred 'A' shares, £697,000 (2015: £nil) relating to Preferred 'B' shares and a shareholder loan of £232,000 (2015: £115,000). Accrued interest and preference dividends on the preferred A and B shares and the shareholder loan totalled £27,000 (2015:£nil).
- Cardiff University - £9,000,000 (2015: £5,651,000) relating to Preferred 'B' shares and a shareholder loan of £2,017,000 (2015: £1,000,000). Accrued interest and preference dividends on the preferred B shares and shareholder loan totalled £46,000 (2015:£nil).

Figure 11 Related party transactions disclosure by IQE's JV, Compound Semiconductor Centre Limited
Source: Compound Semiconductor Centre Limited's 2016 annual filing

JV Number 1: Compound Semiconductor Centre Limited

In our view, the Compound Semiconductor Centre JV sounds like little further than a research and development (R&D) collaboration. In forming this JV, it is our view that IQE has effectively placed this R&D "off-balance sheet". IQE group companies have achieved significant profits from this JV relationship, while the CSC JV retains growing losses. Significant net cash transfers also appear to have been made from the CSC JV to IQE group companies. Other than IQE group companies, the CSC JV appears to have no other customers. As the CSC JV's role is described as development based, it is not apparent to us why this JV would class as a commercial relationship in our understanding of the true sense of commercial. And yet the profits generated by the JV are significant when compared to IQE's wider source of profit.

Introduction

Compound Semiconductor Centre Limited ("**CSC**") was incorporated in the United Kingdom on 9 September, 2014, by Dr Andrew Nelson and Phillip Rasmussen. IQE Plc was listed as the sole shareholder. On 6 July 2015, it become a joint venture (JV) between IQE and Cardiff University.

CSC: A 50/50 JV

IQE describes the CSC JV as follows (our bold for emphasis):

> *These JVs [the Singapore JV and the Cardiff JV] are commercial entities **seeking to develop and commercialise new products**, to which IQE has first manufacturing rights. IQE's equity share in each JV is ~50%, and it jointly controls these JVs with its JV partners.*
>
> *The license revenue earned and recognised by IQE reflects only its share (~50%) of the gross income (i.e. is stated after the elimination of unrealised gains). Given that the JVs are related parties, the licence fees were determined with independent valuation[15].*

And more recently as such (our bold for emphasis):

> *These joint ventures were established with IQE's partners to provide a bridge between academia and industry. Our university partners are participating in these JV's **to provide a cost-effective route to commercialise their new technologies**, whereas IQE and its industrial partners are **using the JV's to seed future revenues by using their "right of first refusal" over the commercial supply of these new technologies**[16].*

Cardiff University describes the CSC JV as follows (our bold for emphasis):

> *The investment is integral to the establishment of the Institute for Compound Semiconductors which will be based in the Translational Research Facility (TRF) on the Innovation Campus. The **Institute will provide facilities to help researchers and industry***

[15] IQE plc 2015 Annual Report – Page 10
[16] IQE plc 2017 H1 Interim Report

***work together**, positioning Cardiff as the UK and European leader in compound semiconductors*[17].

The relationship between IQE and its CSC JV

Filings at UK Companies House show a relatively circular relationship between the CSC JV and wholly-owned subsidiaries of IQE. This relationship appears to have proven a benefit to IQE's cash flow in both 2015 and 2016. These developments are illustrated in figures 12 to 19, with further information detailed thereafter.

Compound Semiconductor Centre Limited		2015	2016
Revenue	£m	**1.52**	**3.96**
of which sales to IQE plc group companies	*£m*	*1.52*	*3.96*
Sales to IQE plc group companies as % of CSC JV Revenue	%	**100.0%**	**100.0%**
Other recharges to IQE plc group companies	*£m*	*0.00*	*4.88*
Total sales and other recharges to IQE plc group companies	***£m***	***1.52***	***8.83***
Cost of sales	£m	-2.06	-8.14
Recharges of costs from IQE plc group companies	*£m*	***-0.15***	***-6.22***
Recharges of costs from IQE plc group companies as % of CSC JV Cost of sales	%	**7.1%**	**76.4%**
Gross profit/(loss)	£m	**-0.54**	**-4.19**
Administrative expense	£m	-0.41	-0.44
Interest expense	£m	0.00	-0.04
Total costs	£m	-2.48	-8.62
PBT	£m	**-0.95**	**-4.67**

Figure 12 Compound Semiconductor Centre Limited profit and loss account with details of sales, purchases and recharges of costs to IQE group companies
Source: Compound Semiconductor Centre Limited's annual filings

Compound Semiconductor Centre Limited		2015	2016
Revenue	£m	**1.52**	**3.96**
of which sales to IQE plc group companies	*£m*	*1.52*	*3.96*
Sales to IQE plc group companies as % of CSC JV Revenue	%	**100.0%**	**100.0%**
Trade receivables due from IQE plc group companies to the CSC JV	*£m*	*1.10*	*4.09*
Trade receivables due from IQE plc group as a % of CSC JV Revenue	%	**72.6%**	**103.5%**
Cost of sales	£m	-2.06	-8.14
Trade payables due to IQE plc group companies from the CSC JV	*£m*	***-0.45***	***-2.05***
Trade payables due to IQE plc group companies as a % of CSC JV Cost of sales	%	**21.6%**	**25.2%**
Net trade receivables due from IQE plc group companies to the CSC JV	£m	**0.66**	**2.04**

Figure 13 Compound Semiconductor Centre Limited revenue and cost of sales as compared to trade receivables due from and payables due to IQE group companies
Source: Compound Semiconductor Centre Limited's annual filings

[17] Cardiff University – Financial Statements year ended 31 July 2016

The CSC JV annual filings state that the only sales the JV has achieved since its incorporation are related to sales to IQE group companies.

Will CSC ever have any other customers?

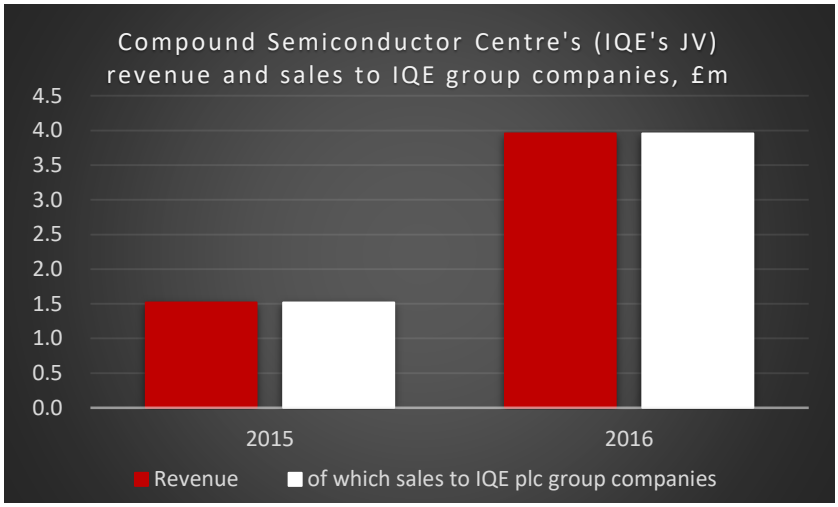

Figure 14 CSC JV revenue and sales to IQE plc group companies, from 2015-2016, £m
Source: Compound Semiconductor Centre Limited's annual filings

Whereas CSC reported £4.0 million in sales to IQE group companies, it states that it passed on a further £4.9 million in other recharges to IQE group companies in 2016.

CSC reported £8.8 million in sales and recharges to IQE group companies in 2016.

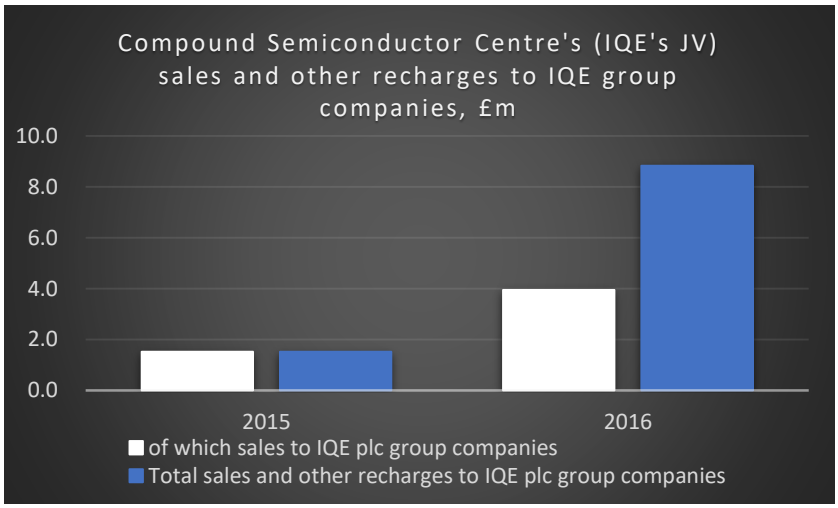

Figure 15 CSC JV sales and recharges to IQE plc group companies, from 2015-2016, £m
Source: Compound Semiconductor Centre Limited's annual filings

Meanwhile, CSC states that it incurred recharges from IQE group companies of £0.2 million in 2015, rising to £6.2 million in 2016.

These transactions appear somewhat circular in nature.

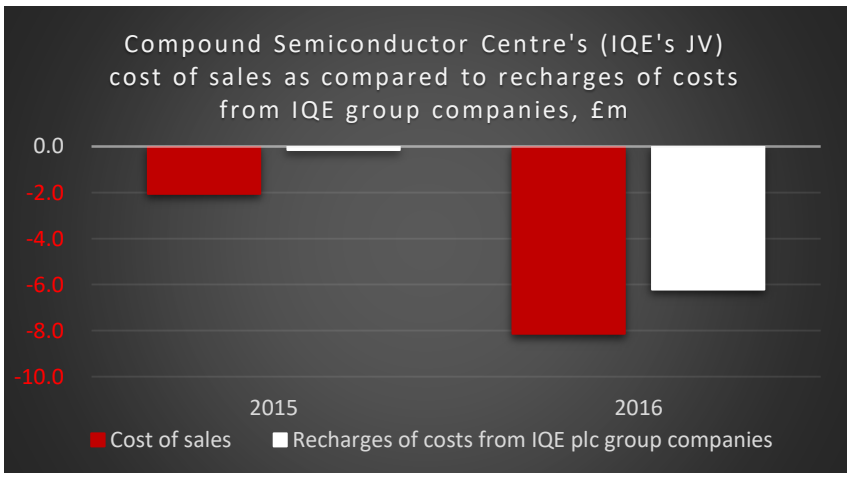

Figure 16 CSC JV cost of sales as compared to recharges incurred from IQE group companies, from 2015-2016, £m
Source: Compound Semiconductor Centre Limited's annual filings

Whereas the CSC JV made sales of £4.0 million to IQE group companies, CSC had £4.1 million in trade receivables due from IQE group companies in 2016.

CSC's receivables due from IQE group companies rose from 73% in 2015 to 104% of CSC's revenue in 2016.

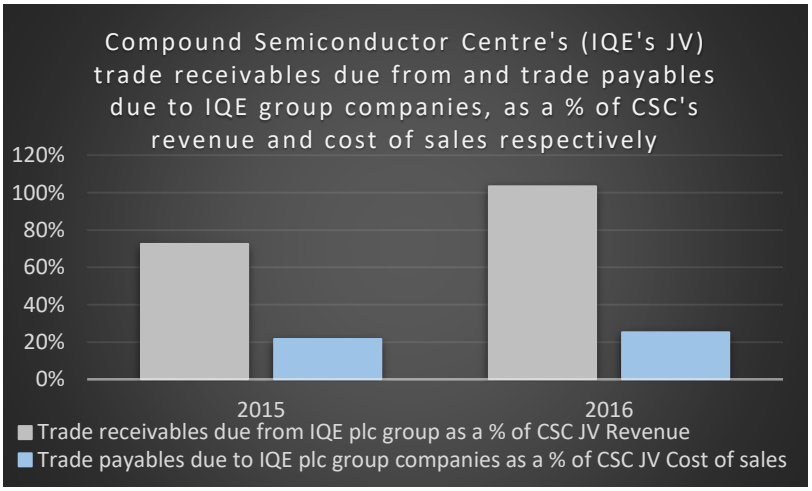

Figure 17 CSC JV trade receivables due from IQE group companies as a % of revenue and payables due to IQE group companies as a % of cost of sales, from 2015-2016, £m
Source: Compound Semiconductor Centre Limited's annual filings

In 2015, IQE group companies appear to have benefited from £7.7 million in net cash flows from the CSC JV to IQE group companies.

In 2016, the net cash flows from the CSC JV to IQE group companies appears to be £7.0 million.

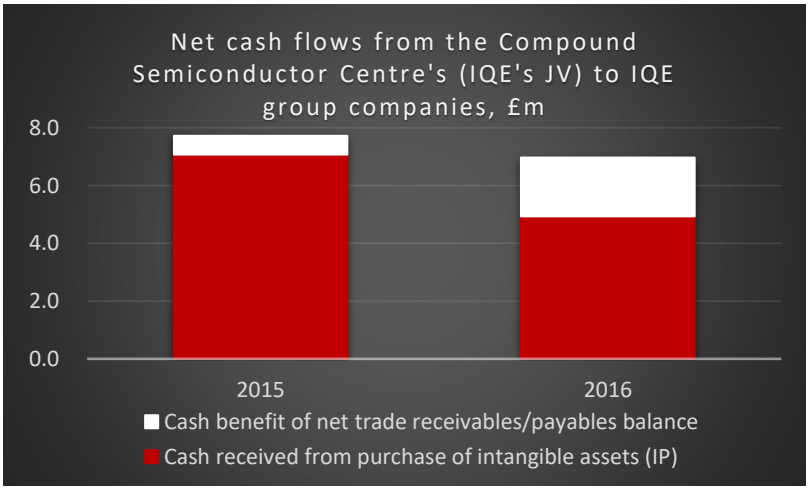

Figure 18 Net cash flows from purchase of IP and benefit of net trade receivables/payables balance to IQE group companies from the CSC JV, from 2015-2016, £m
Source: Compound Semiconductor Centre Limited's annual filings

The CSC JV reported net cash expenditure of £2.0 million rising to £5.8 million on tangible assets in 2015 and 2016, respectively.

CSC reports that IQE contributed equipment to the CSC JV, so was this payment for that equipment?

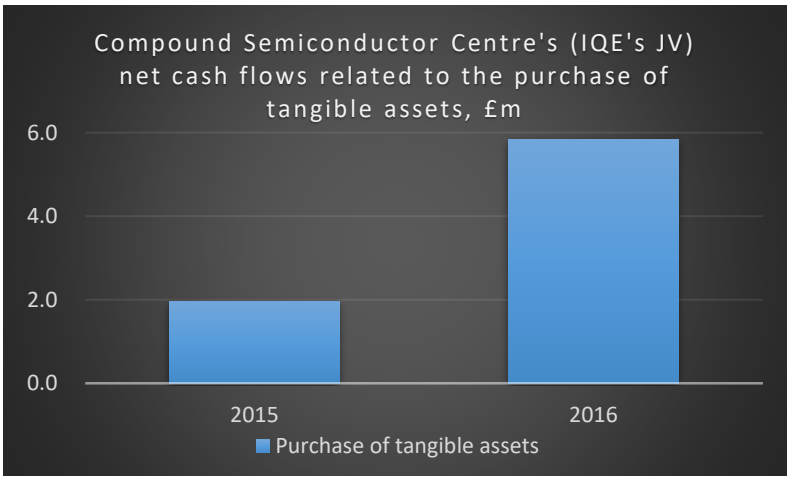

Figure 19 CSC JV net cash expenditure on tangible assets, from 2015-2016, £m
Source: Compound Semiconductor Centre annual filings

Sale of IP to its CSC JV, however is there anyone else?

IQE goes to some length to highlight its Intellectual Property (IP) and how license income from the commercialisation of this IP constitutes **a new revenue stream**. For example, in 2016 IQE highlighted (our bold for emphasis):

> ***License Income***
>
> ***Licensing income reflects a new revenue stream from the commercialisation of our IP portfolio*** *accounting for 5% of the Group's sales in 2016, down from the previous year's peak at 7% of revenues.* ***IQE has developed a powerful IP portfolio which we are now able to monetise from both product sales and licensing of the IP***[18].

And further highlighted:

> ***Our IP is becoming increasingly attractive to customers*** *wishing to access IQE's vast technical experience and expertise to develop and exploit new opportunities in new and emerging markets.*
>
> *Our IP continues to add significant value to our product and service offering for both existing customers and the large number of new entrants to global technology markets*[19].

Our concern with these statements is that this view of *"a new revenue stream"* has been largely mirrored by the sell side research community[20]. Further, that from the sell side research we have seen, that the profitability attributable to this sale of IP has been factored into the group's overall profitability[21].

However, whenever we have been able to locate the source of the monetisation of this IP from either product sales or licensing, it has generally led back to IQE's own JVs. This would not be overly concerning were it not for the fact that IQE's subsidiaries appear to be the only customers to both the CSC JV and the CSDC Singaporean JV. Excluding these IQE group companies, the JVs appear to have no other customers. Therefore, instead of reflecting *"a new revenue stream"*, this could be as much construed to be more akin to IQE's own JVs purchasing or licensing IP from IQE itself and selling directly

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[18] IQE plc 2016 Annual Report – Page 17

[19] IQE plc 2016 Annual Report – Page 16

[20] An extract from Edison Research highlights (our bold for emphasis): "*Licence income is a relatively new revenue stream for IQE. The first revenues were generated in FY15 following the formation of JV's in the UK and Singapore" And "Segmental revenues are expected to be relatively lumpy. They totalled £1.0m in H117, H116 segmental revenue totalling £3.5m were higher because they included one-off upfront fees.* ***We model FY17 and FY18 licence income at FY16 levels.***" This extract is from an Edison Research note published 18 September 2017. Edison is an investment research and advisory company. Edison is authorised and regulated by the United Kingdom's Financial Conduct Authority (FCA). The extract referred to is from an Edison report that was commissioned by IQE and prepared and issued by Edison for publication globally.

[21] For example, the same Edison note highlighted above includes the profit from licence income from sales to joint ventures within its estimates and forecasts of historical and future operating profits.

back to those IQE group companies. In our view, this is an altogether circular state of affairs and is difficult to fathom as a true meaning of *"commercialisation"*.

At the time of writing, IQE is valued on a c. 42 times EV multiple of 2016 adjusted operating profit[22]. However, c. £6.6 million (or 30%) of that 2016 adjusted operating profit reflected profit from licence income from sales to joint ventures. This might suggest that approximately £278 million (or c. 30%) of IQE's current enterprise valuation is attributable to the benefit of this apparent circular state of affairs[23], which in our view is not an inconsiderable quantum.

Compound Semiconductor Centre purchases and recharges

According to IQE's wholly-owned subsidiary, IQE (Europe) Limited's, 2016 annual filing:

> *During the year IQE (Europe) Limited recognised license income of £3,263,000 (2015: £9,449,000), recharged costs of £5,411,000 (2015: £379,016) and purchases of £7,605,000 (2015: £913,376) to the Compound Semiconductor Centre Limited which is a 50% owned joint venture between the IQE group and Cardiff University*[24].

At a group level, IQE states that it recognised £8,024,000 and then £6,658,000 in license income from sales to joint ventures in 2015 and 2016 respectively; £14,682,000 combined. However, as per above, IQE's subsidiary, IQE (Europe), reports that it recognised £9,449,000 and £3,263,000 in license income to the Compound Semiconductor Centre Limited JV, in 2015 and 2016 respectively; £12,712,000 combined. I.e. somewhat contradictory, the IQE (Europe) subsidiary recognised £1,425,000 more than what the group recognised in 2015. It is not obvious to us why this apparent discrepancy is present. We presume that it is a result of consolidation of the accounts at group level or further sales of IP from other subsidiaries.

In our view, the picture is less clear when the CSC JV 2015 annual filing states (our bold for emphasis):

> *Subsequent to the formation of the Joint venture the Company [Compound Semiconductor Centre Limited]* ***purchased £15,070,000 of Intellectual property from the IQE plc Group*** *in return for £8,000,000 of preference shares and* ***£7,070,000 of cash***[25].

And then in 2016 states (our bold for emphasis):

[22] Source: Bloomberg
[23] At the time of writing, IQE's market capitalisation was £890 million, and we have assumed that its net cash balance to be c. £45 million as per Bloomberg consensus.
[24] IQE (Europe) Limited – 2016 Report and Financial Statements – Page 29, Note 22.
[25] Compound Semiconductor Centre Limited – 2015 Report and Financial Statements – Page 30, Note 15.

> *Subsequent to the formation of the Joint venture the Company [Compound Semiconductor Centre Limited]* ***purchased £20,000,000 of Intellectual property from the IQE plc Group*** *in return for £8,000,000 of A preference shares and* ***£12,000,000 of cash***[26].

Hence, according to the CSC JV, it purchased £20 million of IP from IQE group in return for £8 million in preference shares and £12 million in cash during 2015 and 2016.

By contrast, at a group level, IQE states:

> *The profit arising from license income sales to joint ventures in 2015 represents revenue of £15,310,000 offset by elimination of unrealised profit of £7,286,000 relating to our retained interest in the Compound Semiconductor Centre Limited joint venture. No such elimination has occurred in 2016*[27].

IQE's equipment contribution marked up in value from its NBV, resulting in profit on disposal

In establishing the CSC JV, IQE is reported to have contributed equipment with a market value of £12 million, while Cardiff University contributed £12 million in cash, respectively, in return for each party's equity interest[28]. The equipment that IQE contributed to the CSC JV appears to have been marked up in value from its net book value (NBV) by a factor of c. 4.7x the NBV previously held by IQE subsidiaries.

Net book value of PPE disposed by:		2015
IQE (Europe) Limited	£m	1.95
IQE Silicon Compounds Limited	£m	0.60
Total	**£m**	**2.55**

Profit on disposal of PPE recognised by:		2015
IQE (Europe) Limited	£m	6.01
IQE Silicon Compounds Limited	£m	3.49
Total	**£m**	**9.50**

Net book value of PPE + profit on disposal of PPE recognised by:		2015
IQE (Europe) Limited	£m	7.96
IQE Silicon Compounds Limited	£m	4.09
Total	**£m**	**12.05**

		2015
Equipment contributed by IQE group companies to the CSC JV	£m	12.00
Non-cash gain recognised on disposal of fixed assets to CSC JV	£m	4.80
Implied NBV of equipment contributed to CSC JV	**£m**	**7.20**

Compound Semiconductor Centre Limited		2015	2016	Cumulative total
Cash outflow on purchase of tangible assets	£m	-1.95	-6.73	**-8.68**
Cash inflow from sale of tangible assets	£m		0.90	**0.90**
Net cash outflow on purchase of tangible assets	**£m**	**-1.95**	**-5.84**	**-7.78**

Figure 20 PPE disposals by IQE group subsidiaries & receipt of PPE by CSC JV from IQE as compared to PPE cash outflows by the CSC JV
Source: IQE (Europe) Limited, IQE Silicon Compounds Limited, IQE plc and Compound Semiconductor Centre Limited annual filings

[26] Compound Semiconductor Centre Limited – 2016 Report and Financial Statements – Page 34, Note 20.
[27] IQE 2016 annual filing – Page 84, Note 3.
[28] Compound Semiconductor Centre Limited – 2015 Report and Financial Statements – Page 28, Note 15: *"IQE plc group companies own 50% of Compound Semiconductor Centre Limited (the "Company") along with the remaining 50% owned by Cardiff University. In establishing the joint venture, IQE contributed equipment with a market value of £12m, which was matched by a £12m cash contribution from Cardiff University."*

For example, in 2015, we note that IQE's subsidiaries: IQE (Europe) Limited and IQE Silicon Compounds Limited, each reported a profit on disposal of property, plant and equipment of £6.0 million[29] and £3.5 million[30], respectively; £9.5 million in total. This compares to disposals by IQE (Europe) and IQE Silicon Compounds of plant and machinery with net book values of £2.0 million and £0.6 million, respectively; £2.6 million in total.

In its 2015 Group annual accounts, IQE reported a total profit on disposal of property, plant and equipment to its JVs of £4.8 million[31].

As with other features of IQE's relationship with its JVs, we find it somewhat unorthodox that the group transfers assets, seemingly with a net book value of less than £3 million, which are marked up in value, resulting in a gain on disposal for IQE of nearly £5 million.

Meanwhile IQE's investment in the CSC JV appears to be swiftly and largely written off

In addition to transferring PPE with an apparent NBV of c. £3 million at a marked-up value to £12 million, IQE transferred c. £15 million worth of IP and a further c. £5 million in IP to its CSC JV in 2015 and 2016 respectively. IQE received £8 million in preference shares in CSC and £12 million in cash in lieu of this IP transfer. However, subsequent to this receipt it appears that the value of the preference shares and its other equity interest was almost immediately impaired[32].

For example, according to the IQE (Europe) Limited 2016 report and financial statements:

> *Exceptional items in 2015 related to the impairment of the company's* [IQE (Europe) Limited's] *investment in its associate* [CSC] *(£7,998,000) partially offset by the profit on disposal of property, plant and equipment (£6,011,000)*[33].

In note 10 of IQE (Europe) Limited's 2016 filings, CSC is detailed as the associate for which the investment was written off[34].

In fact all of the stock proceeds received from CSC for the sale of IP by IQE to CSC appear to have been swiftly written-off by IQE. Similar to IQE (Europe) Limited, which controls 33% of CSC[35], IQE's other

[29] IQE (Europe) Limited – 2016 Report and Financial Statements – Page 21, Note 4

[30] IQE Silicon Compounds Limited – 2016 Report and Financial Statements – Page 20, Note 4

[31] IQE plc Group 2015 annual report – Page 28: "The profit on disposal of fixed assets of £5.2m primarily reflects a gain of £4.8m on the establishment of the UK JV, in which the Group contributed equipment in return for its 50% equity share.

[32] It is not entirely clear which equity line in Compound Semiconductor Limited was written-off by IQE, nor that it is that vital to understanding the wider implications of these actions. We presume it was the preference shares. Further, we note that the year-end period for the respective companies is aligned, that being 31 December.

[33] IQE (Europe) Limited – 2016 Report and Financial Statements – Page 21, Note 4

[34] Ibid – Page 24, Note 10: *"Investments comprise equity shares in The Compound Semiconductor Centre Limited, a company incorporated in the United Kingdom. The address of the registered office of The Compound Semiconductor Centre Limited is Pascal Close, St Mellons, Cardiff, CF3 0LW [same registered address as for IQE plc]."*

[35] Ibid – Page 24, Note 10: *"The company [IQE (Europe) Limited] owns 33% of the ordinary shares of The Compound Semiconductor Centre Limited (2015: 33%)."*

subsidiary, IQE Silicon Compounds Limited, which controls the remaining 17% of CSC[36], also wrote-off its investment in CSC:

> *Exceptional items in 2015 related to the impairments of the company's* [IQE Silicon Compounds Limited] *investment in its associate* [CSC] *(£4,040,000) partially offset by the profit on disposal of property, plant and equipment (£3,393,000)*[37].

In total, it would appear that IQE group companies wrote-off c. £12 million in relation to investment in the CSC JV. While IQE appears to have impaired a significant portion of its investment in CSC, by contrast, the JV partner, Cardiff University, continues to carry its investment at full value[38]. Cardiff University's 2016 annual report highlights:

> ***Carrying value of Compound Semiconductor Centre Limited***
>
> *The investment made in July 2015 with further payments made during 2015/16 relating to the new joint venture in Compound Semiconductor Centre is considered to be recoverable based upon a business model that shows sufficient returns to support the recovery of the investments*[39].

Summary

On the basis of the above it would appear that:

- IQE contributed equipment to CSC, with a NBV of c. £2.5 million, which was marked up in value to £12 million and eventually booked to the Group as a c. £4.8 million profit in 2015.
- IQE sold CSC £15.1 million in IP, receiving £8.0 million in stock and £7.1 million in cash in 2015.
- IQE sold CSC a further £4.9 million in IP in return for £4.9 million in cash in 2016.
- While IQE contributed equipment marked up to a value of £12 million to CSC, it then impaired £12.0 million in value relating to its investment in CSC, seemingly received in lieu of this marked-up contribution.
- Cardiff University, the co-owner of the JV, has not impaired its investment in the CSC.

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[36] IQE Silicon Compounds Limited – 2016 Report and Financial Statements – Page 23, Note 11: *"The company* [IQE Silicon Compounds Limited] *owns a 17% equity interest in the ordinary share capital of Compound Semiconductor Centre Limited … The cost of investment in Compound Semiconductor Limited was £4,040,000 and has been fully provided at 31 December 2016 and 31 December 2015."*

[37] Ibid – Page 20, Note 4

[38] There may be an explanation why Cardiff University carries its investment at full value and yet IQE's subsidiaries appear to have largely impaired the investment value. However, we have been unable to determine the reasoning for this.

[39] Cardiff University – Financial Statements year ended 31 July 2017 – page 29.

JV Number 2: CSDC Private Limited (Singapore)

In our view, much like IQE's other JV, the Singaporean JV, CSDC, sounds like little further than a research and development (R&D) collaboration between IQE and its local partners. Further, it would appear that IQE's wholly-owned Singaporean subsidiary, MBE Technology, suffered a significant decline in revenue during 2013. It is not apparent to us where this is reconciled in the Group's consolidated accounts. However, by 2015, MBE's remaining revenue appears to solely stem from its JV, while the JV's revenue appears to result from MBE. It is our view that this is a somewhat circular and unorthodox reflection of IQE's claims of *"new revenue streams"*.

Introduction

CSDC Private Limited (Singapore) (**"CSDC"**) was incorporated in Singapore on 21 May 2014, as a 100% owned subsidiary of IQE plc[40]. On 23 March 2015, MBE Technology PTE Ltd (**"MBE"**), another wholly-owned subsidiary of IQE, entered into a joint venture (JV) agreement whereby MBE took ownership of CSDC with the JV partners, WIN Semiconductors Corp, Nanyang Technological University, and seemingly several academics at Nanyang Technological University[41].

MBE describes the CSDC JV as follows (our bold for emphasis):

> ***The CSDC is a centre of excellence for compound semiconductor technology, with the aim of accelerating the development and commercialisation of new advanced semiconductor products in Singapore, and to provide an effective incubator for bringing new innovations to market.***
>
> *MBE Technology Pte Ltd (the "Company") has a 50% equity stake in the new venture. As part of its contribution to the establishment of the CSDC, the Company is providing facilities, equipment and intellectual property on favourable terms.*
>
> *The asset and lease provisions booked in 2013 relate to the Company setting aside capacity in its facility and certain equipment for use by the CSDC.*
>
> *In return, IQE Group and the Company will be the production partner for the high volume manufacturing that emerges from this incubator[42].*

The relationship between MBE and its JV, CSDC

Local company filings from Singapore highlight what, in our view, seems a somewhat odd twist in the performance of MBE and its subsequent relationship with its JV, CSDC (Singapore). These developments are illustrated in figures 21 to 26, with more detailed information thereafter.

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[40] CSDC Private Limited (Singapore) 2014 annual filing – Page 18, Note 9.
[41] CSDC Private Limited (Singapore) 2015 annual filing – Page 5 – "CSDC joint venture formation".
[42] MBE Technology Pte Ltd 2014 annual filing – Page 44, Note 22.

MBE Technology's (a wholly-owned IQE subsidiary) revenue declined by c. £11.5 million (c. 63%) in 2013. It is unclear to us why it declined nor where it is represented in the group annual filings. It's possible the relating revenue was booked to another subsidiary.

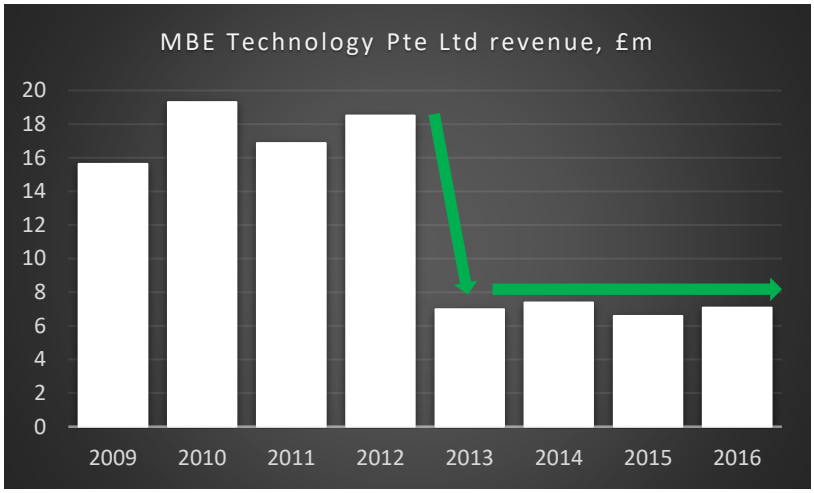

Figure 21 MBE Technology Pte revenue from 2011-2016, £m
Source: MBE Technology annual filings. For FX rates used please see figure 29

However, at the time, MBE was (and remains), the only subsidiary that IQE controlled in Singapore. The only noticeable difference in revenue by location was in Americas. But revenue growth here appears to have been largely driven by the Kopin Wireless acquisition.

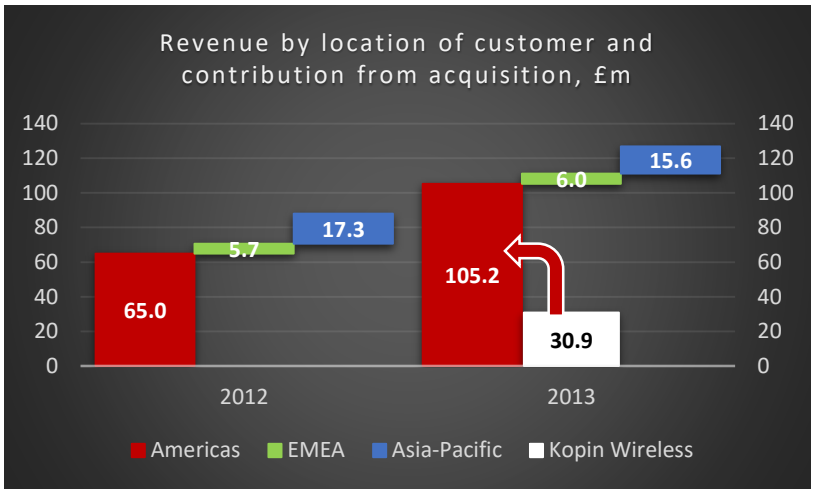

Figure 22 IQE plc revenue by location of customer from 2012-2013, together with reported contribution from the Kopin Wireless acquisition, £m
Source: IQE plc annual filings.

MBE also wrote down c. £9.7 million in property, plant machinery and equipment value in 2013.

Again, it is unclear why it was written down and where this was represented in the group annual filings.

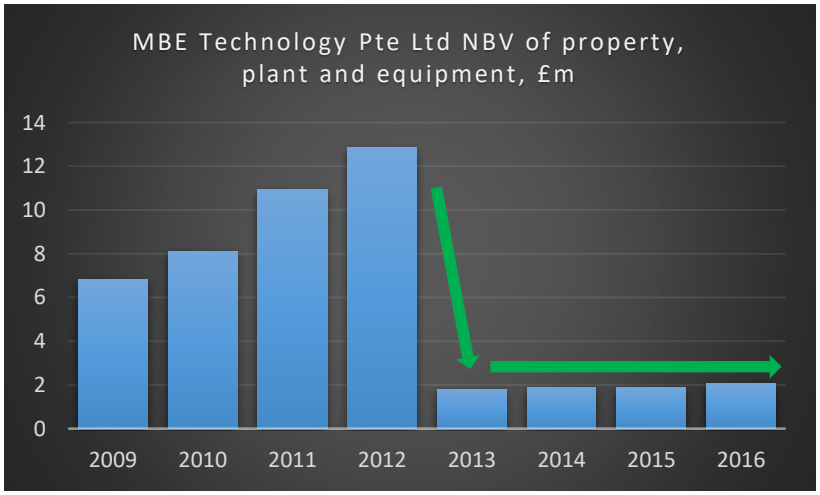

Figure 23 MBE Technology Net Book Value (NBV) of plant machinery and equipment from 2011-2016, £m
Source: MBE Technology annual filings. For FX rates used please see figure 29

At group level, IQE's NBV of PPE in Singapore, which is where MBE is based, declined by just £2.4 million, as compared to the c. £9.7 million write-down locally.

Any increases in PPE appear to have been driven by the Kopin Wireless acquisition.

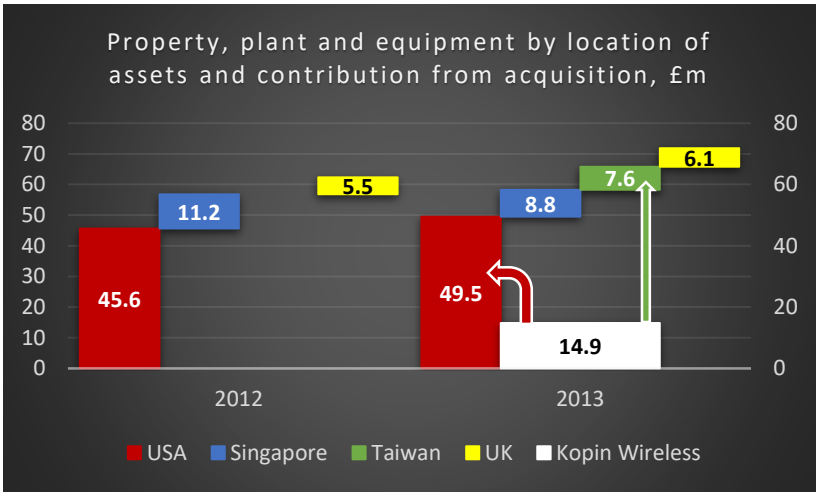

Figure 24 IQE plc NBV of PPE by location of assets from 2012-2013, together with reported contribution from the Kopin Wireless acquisition, £m
Source: IQE plc annual filings.

In 2014, the CSDC JV was incorporated.

While MBE's revenue declined by c. £11.5 million in 2013, by the time of 2015 almost all of MBE's revenue was attributable to sales to its own JV, CSDC.

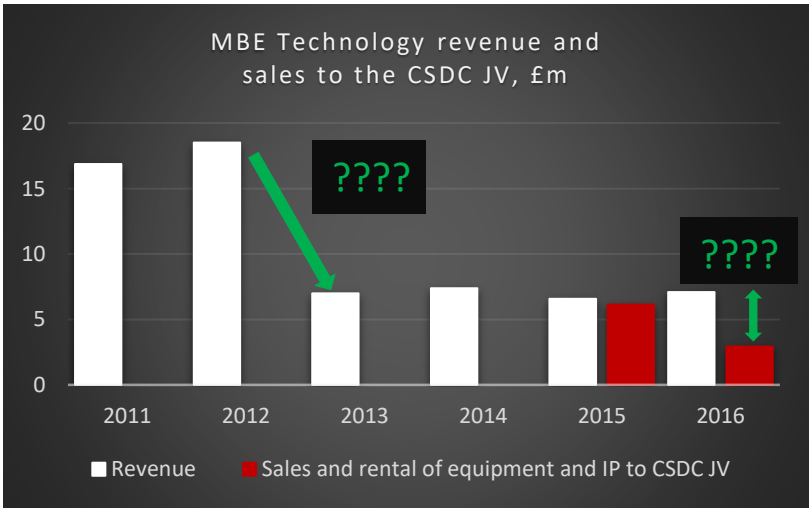

Figure 25 MBE Technology Pte revenue and sales to its JV, CSDC from 2011-2016, £m
Source: MBE Technology annual filings. For FX rates used please see figure 29

Furthermore, while almost all of MBE's revenue was attributable to sales to its own JV, CSDC, more than all of its costs were related to purchases from its own JV, CSDC.

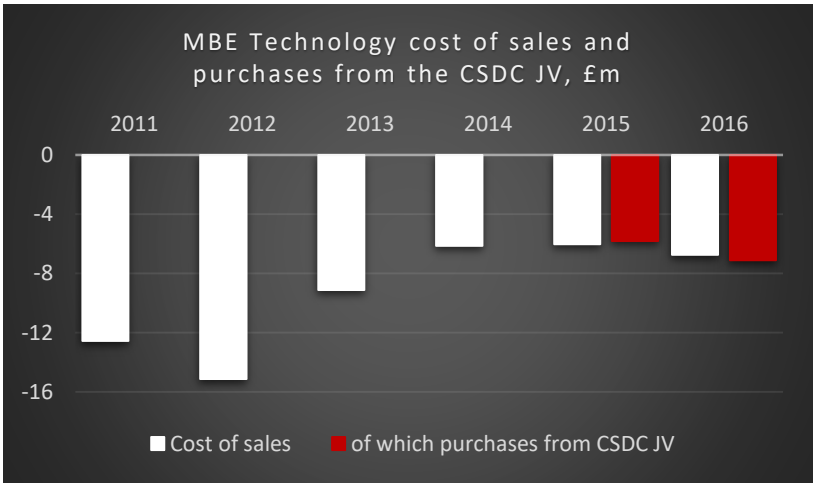

Figure 26 MBE Technology Pte cost of sales to and purchases from its JV, CSDC from 2011-2016, £m
Source: MBE Technology annual filings. For FX rates used please see figure 29

MBE's precipitous decline in revenue

According to MBE's annual filings, in 2012, MBE reported USD $29.3 million (c. £18.5 million) in revenue in 2012[43]. A year later, MBE's revenue fell by c. £11.5 million or 63% to USD $10.9 million (c. £7.0 million) in 2013[44]. This revenue path is illustrated in figure 26 and is compared to IQE's reported revenue by location of customer.

Until 2012, MBE's revenue closely aligned with that reported by IQE (at a group level) as revenue attributable to the Asia Pacific region.

Then in 2013, the group reported significantly higher revenue than that of MBE in Asia Pacific. Further, almost all of MBE's revenue in 2015 was a result of sales to the CSDC JV. And 2016 appears little different.

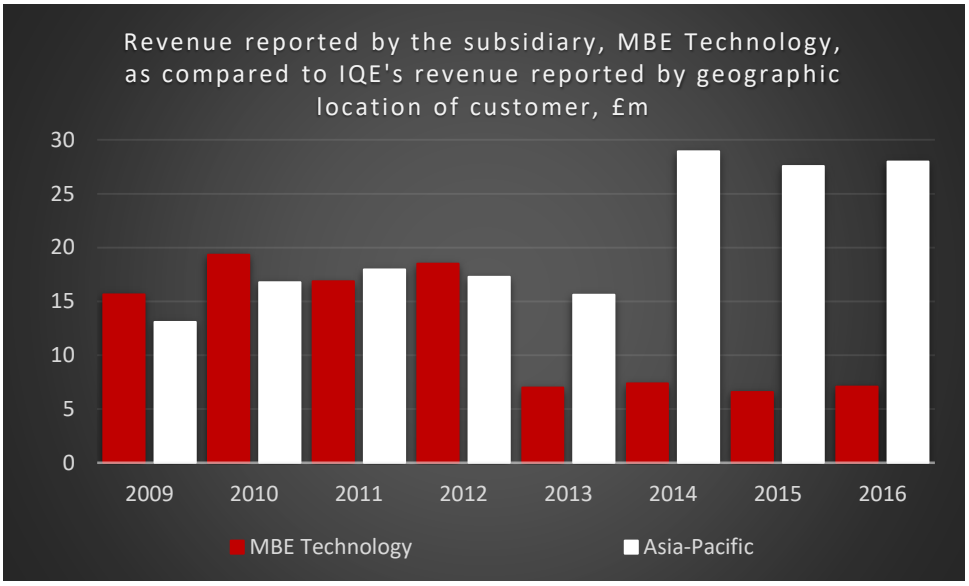

Figure 27 MBE Technology revenue as compared to IQE's reported revenue by location of customer, from 2009-2016, £m
Source: MBE Technology and IQE plc annual filings. For FX rates please see figure 29

This raises several questions:

1. Why did the revenue decline so rapidly?
2. Was it a straight forward organic decline in revenue at IQE's wholly-owned subsidiary, MBE?
3. Was the revenue allocated to another subsidiary or geographic region?
4. Where was this reflected in IQE's group accounts?

Regarding questions 1 and 2, there may well be straight forward answers. However, from our review of IQE's historical filings, we have been unable to locate and determine the reasoning for this. In relation to questions 3 and 4, we have also struggled to find obvious answers.

Whilst MBE's revenue was reported to be c. £18.5 million in 2012[45], this was relatively close to the £17.3 million in revenue which IQE reported (at a group level) as attributable to Asia Pacific by location

[43] MBE Technology Pte Ltd 2012 annual filing – Page 8. Year ended 31 December 2012. FX rate used GBP:USD 1.5853
[44] MBE Technology Pte Ltd 2013 annual filing – Page 7. Year ended 31 December 2013. FX rate used GBP:USD 1.5647
[45] MBE Technology Pte Ltd 2012 annual filing – Page 8. Year ended 31 December 2012. FX rate used GBP:USD 1.5853

of customer[46]. This is also the case for 2009, 2010 and 2011. Then in 2013, whereas MBE's revenue precipitously fell, by contrast, IQE (at a group level) reported only a modest decline to £15.6 million in 2013 from the Asia Pacific region[47].

The relatively small decline in Asia Pacific related revenue may mean that the more significant decline in MBE's revenue was transferred elsewhere. However, MBE was IQE's only Singaporean based subsidiary at the time (and remains so)[48]. So perhaps MBE's revenue decline was booked to another region?

Further, as we highlight in figure 25 above and detail further below, almost all of MBE's revenue since 2015 has seemingly been attributable to demand from its own CSDC JV, meaning that we find that the sudden jump in Asia Pacific based revenue in 2014, followed by a slight tailing off through to the latest reported figure of £28.0 million in revenue attributable to the region in 2016 appears somewhat odd.

In terms of whether or not the decline in MBE's revenue was allocated to another geographic region, we note that IQE reports that revenue from the EMEA region modestly rose, to £6.0 million in 2013, from £5.7 million in 2012[49]. So it is not apparent that MBE's revenue decline found its way to EMEA.

IQE reports that revenue in the Americas, rose to £105.2 million in 2013, from £65.0 million in 2012[50]. However, the Americas based revenue would appear to have largely risen as a result of the acquisition of Kopin Wireless on 15 January 2013[51].

Kopin Wireless was acquired for $75 million[52], and according to IQE:

> *Post-acquisition the acquired business [Kopin Wireless] contributed £30.9m of revenue and £1.4m of profit after tax to the consolidated income statement. If the transaction had completed at the beginning of the financial period the acquired business would have contributed £31.9m of revenue and £1.4m of profit after tax to the consolidated income statement[53].*

Hence, the £40.2 million in Americas' based revenue growth would appear to have largely been driven by the £30.9 million contribution from Kopin Wireless. This would suggest that the Americas based revenue, ex-acquisition contribution, grew by £9.3 million. If the c. £11.5 million MBE revenue decline

[46] IQE plc 2013 Annual Report – Page 64, Note 3.
[47] IQE plc 2013 Annual Report – Page 64, Note 3.
[48] IQE plc 2013 Annual Report – Page 85, Note 25: Principal subsidiary undertakings
[49] Ibid
[50] Ibid
[51] IQE plc 2013 Annual Report – Page 80, Note 18.
[52] Of which $60 million was paid in cash on completion, and $15 million became payable in January 2016.
[53] IQE plc 2013 Annual Report – Page 80, Note 18.

found its way to being booked in the Americas, then this would suggest that IQE achieved no organic revenue growth in 2013.

Overall, it is unclear to us how or where the c. £11.5 million decline in revenue attributable to MBE was reported in the group accounts.

MBE's significant impairment of plant machinery and equipment

Another anomaly we have been unable to reconcile is the impairment to MBE's tangible asset base. At the end of 2012, MBE reported USD $20.4 million (c. £12.8 million) of net book value in property, plant and equipment (PPE). This was close to the £11.2 million in NBV of PPE, which IQE reported (at a group level) relating to assets located in Singapore. This is also the case for 2009, 2010 and 2011.

MBE's NBV of PPE was significantly impaired in 2013.

By contrast, at a group level, IQE continues to report NBV of PPE based in Singapore far higher than that reported locally by MBE.

And yet, it would appear that MBE is the only subsidiary with a Singaporean location.

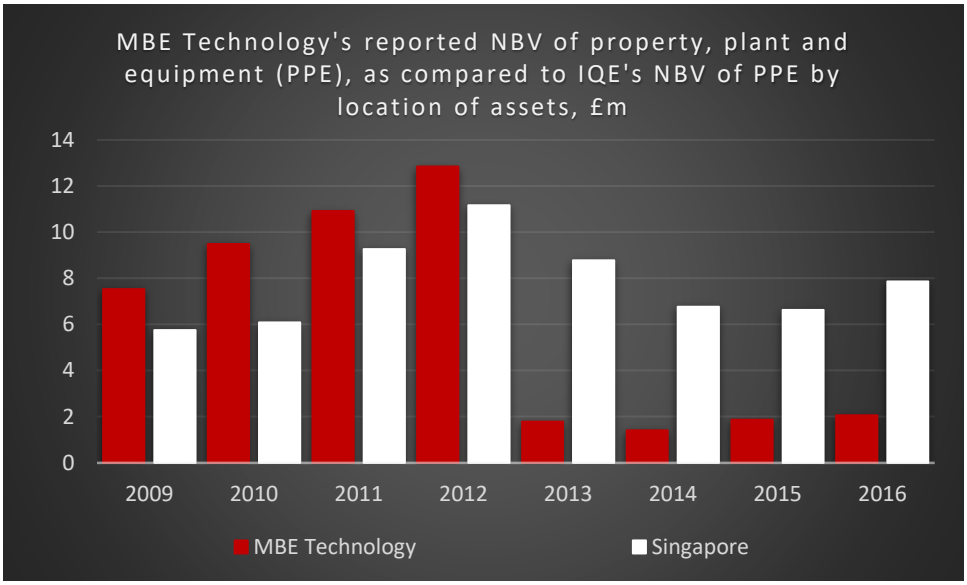

Figure 28 MBE Technology net book value (NBV) of property, plant and equipment (PPE) as compared to IQE's reported NBV of PPE by location of assets, from 2009-2016, £m
Source: MBE Technology and IQE plc annual filings. For FX rates please see figure 29

Then in 2013, MBE impaired this value by USD $15.3 million, which together with depreciation, resulted in a net book value of USD $2.8 million (c. £1.8 million) in 2013[54]. Hence, a c. £9.7 million write-down[55]. By contrast, IQE (at a group level) report PPE with a NBV of £8.8 million as relating to assets located in Singapore.

As with the precipitous decline in revenue, the significant tangible asset impairment raises several questions:

[54] MBE Technology Pte Ltd 2013 annual filing – Page 31, Note 8.
[55] A $15.3 million write-down = £9.7 million at a GBP:USD rate of 1.5647.

1. Why was almost all of the NBV value of MBE's property, plant and equipment impaired?
2. Was it impaired because there was the expectation of a permanent loss of future value associated with the assets?
   a. If not, what other reason?
3. Where was this reflected in IQE's group accounts? We note that in IQE's 2014 annual filing it states that the group "booked provisions of £4.9m for asset impairment comprising the transfer of tools to the newly formed CSDC" JV in 2014. However:
   a. The MBE Technology write-down related to year end 31 December 2013, so why the delay?
   b. The CSDC JV wasn't even incorporated until 21 May 2014, so were these tools and equipment used in the first five months by IQE (despite being written down) or mothballed?
   c. Even if this £4.9 million impairment did related to MBE Technology, it was for £4.9 million and not what seems to have been a £9.7 million impairment at the subsidiary level.

Again, from our review of IQE's historical filings, we have been unable to locate and determine obvious answers to the above questions. The group's NBV of PPE in Singapore, which is where MBE is based, declined by just £2.4 million, as compared to the c. £11.1 million decline reported by the local subsidiary.

FX Rate to GBP £		*1.5670*	*1.5458*	*1.6041*	*1.5853*	*1.5647*	*2.0871*	*2.1011*	*1.8710*
		USD $	USD $	USD $	USD $	USD $	SGD $	SGD $	SGD $
MBE Technology Pte Ltd				**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Net book value									
Property, plant and equipment	USD/SGD $	10.70	12.55	17.51	20.36	2.80	3.92	3.94	3.85
Impairment provision	USD/SGD $					-15.34			
Property, plant and equipment	£m	6.83	8.12	10.92	12.85	1.79	1.88	1.87	2.06
Impairment provision	£m					-9.68			
IQE plc									
Property, plant and equipment by location of assets		**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
USA	£m	11.42	13.34	22.56	45.65	49.45	45.94	44.38	56.10
Singapore	£m	5.76	6.08	9.26	11.17	8.78	6.76	6.63	7.87
Taiwan	£m	0.00	0.00	0.00	0.00	7.56	7.56	8.87	12.62
UK	£m	4.19	4.39	5.53	5.51	6.06	6.33	5.28	8.42
Total	**£m**	**21.37**	**23.81**	**37.35**	**62.32**	**71.84**	**66.59**	**65.15**	**85.00**
Prior year NBV	**£m**	**25.63**	**21.37**	**23.81**	**37.35**	**62.32**	**71.84**	**66.59**	**65.15**
Additions	£m	1.44	5.63	17.39	13.06	5.13	3.17	6.13	13.00
Acquisitions	£m	0.34	0.76		20.00	14.85	-0.34		
Disposals	£m	-0.05	-10.98	-5.68				-44.28	-1.13
Foreign exchange	£m	-7.48	2.43	0.99	-4.14	-4.04	7.09	4.46	32.48
Charge for the year	£m	-3.37	-3.62	-4.18	-6.00	-8.50	-6.59	-6.19	-5.56
Impairment charge for the year	£m					???????	-4.92		
Disposals	£m	0.04	9.83	5.66			0.32	40.73	0.74
Foreign exchange	£m	4.82	-1.61	-0.64	2.06	2.08	-3.99	-2.28	-19.69
NBV	**£m**	**21.37**	**23.81**	**37.35**	**62.32**	**71.84**	**66.59**	**65.15**	**85.00**

Figure 29 MBE Technology net book value of property, plant and equipment (PPE) as compared to IQE's reported NBV of PPE by location of assets, from 2009-2016, £m
Source: MBE Technology and IQE plc annual filings

The provision of assets to the CSDC JV

According to IQE's 2014 annual report (our bold for emphasis):

> *As part of the rationalisation and re-organisation programme, **IQE will be providing facilities, equipment and IP on favourable terms to the CSDC [Singapore JV]** as set out in the critical accounting judgements (note 2) and the post balance sheet events note 27. As a consequence, **IQE has booked provisions of £4.9m for asset impairment relating to the transfer of tools to the CSDC**. The impairment provision writes the assets down to their recoverable amount*[56].

However, when comparing this record of events together with CSDC's filings, it would appear that as opposed to either a sale or transfer of any assets by IQE to CSDC, that they may instead be leased by CSDC from MBE. For example, within the CSDC annual filings, we have been unable to locate any mention of the receipt of equipment or tools from IQE; nor for that matter the receipt of any equipment or tools from any entity. Further, and even more puzzling to us, according to each and every annual filing that CSDC has ever reported (since its incorporation in May 2014), CSDC has never reported any property, plant and equipment – **or indeed any tangible assets of any form whatsoever** – on its balance sheet in 2014, 2015 and 2016.

Within its annual filings, CSDC states that:

> ***Corporate Information***
>
> *The principal activities of the Company [CSDC Private Limited (Singapore)] are the manufacturing and sale of molecular beam epitaxy wafers*[57].

For a company that manufactures and sells molecular beam epitaxy wafers, an absence of any property, plant and equipment on its balance sheet seems to us to be a curious state of affairs. Therefore, we conclude that CSDC leases the equipment in order to produce epitaxy wafers.

Overall, it appears that MBE:

- Experienced a significant decline in revenue in 2013;
- Wrote-down the majority of its property, plant and equipment net book value in 2013;
- Formed the CSDC JV in 2014/15;
- Transferred facilities and equipment to the CSDC JV in 2014/15.

[56] IQE plc 2014 annual report – Page 74, Note 12.
[57] CSDC Private Limited (Singapore) 2016 and 2015 annual filings – Pages 12 and 14 (respectively), Note 1.

However, in our view:

- It is unclear why MBE's revenue declined, nor if it permanently disappeared or was transferred to another subsidiary.
- It is as unclear as to why MBE's PPE was almost entirely written down, and yet although MBE would appear to be IQE's only subsidiary located in Singapore, why IQE continues to report higher PPE related NBV value located in Singapore;
- Despite IQE stating that it transferred facilities and equipment to its CSDC JV, there are no signs in CSDC's accounts that it received facilities and equipment (at least with any value to be booked as assets on its balance sheet);
- It is unclear how, CSDC, a manufacturer and seller of molecular beam epitaxy wafers, apparently operates without any property, plant and equipment that it itself owns. That may be because it leases it. But then that would beg the question: From whom does CSDC lease its PPE?

<u>As we now detail, the only customer that CSDC appears to have is MBE itself. And since 2015, the only customer MBE appears to have is CSDC.</u>

FX Rate to GBP £		*1.567*	*1.5458*	*1.6041*	*1.5853*	*1.5647*	*2.0871*	*2.1011*	*1.8710*
		USD $	USD $	USD $	USD $	USD $	SGD $	SGD $	SGD $
MBE Technology Pte Ltd		**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Revenue	US$/S$, m	**24.5**	**29.9**	**27.1**	**29.3**	**10.9**	**15.4**	**13.8**	**13.3**
of which sales to CSDC JV	US$/S$, m							*10.2*	
of which rental of equipment and IP to CSDC JV	US$/S$, m							*2.7*	*5.5*
Sales and rental of equipment and IP to CSDC JV	*US$/S$, m*							***12.9***	***5.5***
Sales and rental of equipment and IP to CSDC JV as % of Revenue	%							**93.3%**	**41.6%**
Other income	US$/S$, m	1.1	0.8	0.0	0.1	0.1	0.0	1.0	3.3
Cost of sales	US$/S$, m	-16.2	-19.4	-20.2	-24.0	-14.3	-12.8	-12.7	-12.6
of which purchases from CSDC JV	*US$/S$, m*							***-12.2***	***-13.3***
Purchases from CSDC JV as % of Cost of sales	%							**96.3%**	**105.4%**
Gross profit	US$/S$, m	**8.3**	**10.4**	**6.9**	**5.3**	**-3.3**	**2.6**	**1.2**	**0.6**
Total costs	US$/S$, m	-19.4	-23.1	-23.9	-28.2	-45.4	-16.5	-13.8	-13.3
PBT	US$/S$, m	**6.2**	**7.6**	**3.2**	**1.2**	**-34.4**	**-1.0**	**1.0**	**3.3**

		GBP £	GBP £	GBP £	GBP £	GBP £	GBP £	GBP £	GBP £
MBE Technology Pte Ltd		**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Revenue	£m	**15.6**	**19.3**	**16.9**	**18.5**	**7.0**	**7.4**	**6.6**	**7.1**
of which sales to CSDC JV	*£m*							*4.8*	*0.0*
of which rental of equipment and IP to CSDC JV	*£m*							*1.3*	*2.9*
Sales and rental of equipment and IP to CSDC JV	*£m*							***6.1***	***2.9***
Sales and rental of equipment and IP to CSDC JV as % of Revenue	%							**93.3%**	**41.6%**
Other income	£m	0.7	0.5	0.0	0.1	0.0	0.0	0.5	1.7
Cost of sales	£m	-10.3	-12.6	-12.6	-15.1	-9.1	-6.1	-6.0	-6.8
of which purchases from CSDC JV	*£m*							***-5.8***	***-7.1***
Purchases from CSDC JV as % of Cost of sales	%							**96.3%**	**105.4%**
Gross profit	£m	**5.3**	**6.7**	**4.3**	**3.4**	**-2.1**	**1.3**	**0.6**	**0.3**
Total costs	£m	-12.4	-14.9	-14.9	-17.8	-29.0	-7.9	-6.6	-7.1
PBT	£m	**4.0**	**4.9**	**2.0**	**0.8**	**-22.0**	**-0.5**	**0.5**	**1.7**

Figure 30 MBE Technology Pte Ltd revenue and cost of sales from 2009-2016
Source: MBE Technology and IQE plc annual filings

In 2014, the CSDC JV was incorporated. By 2015, despite apparently having no tangible assets whatsoever being reported on its balance sheet, all of CSDC's revenue was attributable to sales of epitaxy wafers. Further, all of CSDC's sales were to its JV owner, MBE. As detailed below, the working capital movements of each entity suggests that MBE was also CSDC's only customer in 2016[58].

Whereas all of CSDC's 2015 and 2016 revenue related to sales to its JV owner, MBE, almost all (93%) of MBE's 2015 revenue appears to have been related to sales back to CSDC. In our view, this is a somewhat unorthodox and circular state of affairs. Especially when it would seem that in order to sell its goods to MBE, that CSDC is relying on the purchase of goods, services and rental of equipment and IP from MBE to produce those goods it sells back to MBE. Further, the fact that CSDC apparently has no other customers for its goods might also raise some concern as to what its purpose is.

In the 2016, the disclosure is less detailed, however, the balance of receivables and payables is, in our view, indicative of the same circular state of affairs as that which occurred in 2015.

For example, according to CSDC's 2016 annual filings, at least 42% of MBE's revenue was attributable to rental of equipment and IP to CSDC[59]. However, whereas CSDC's 2015 annual filing was unequivocal in the related party transactions and its sales and purchases with its JV owner, MBE, the 2016 annual filings for both companies are less clear and apparently contradictory[60].

For example:

- The MBE 2016 annual filing states that it received SGD $3,200,000 in *"income from lease and intellectual property"* from the CSDC JV in 2016[61].

This compares to:

- The CSDC 2016 annual filing which states that it purchased SGD $5,516,000 related to *"rental of equipment and intellectual property rental from MBE Technologies (sic[62]) Pte Ltd"* in 2016[63].

When it comes to payables due from CSDC to MBE, these appear to have significantly risen in 2016.

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[58] CSDC Private Limited (Singapore) 2016 annual filing – Page 21, Note 4: *"Revenue represents income from sale of wafers to immediate holding company, MBE Technology Pte Ltd."*

[59] CSDC Private Limited (Singapore) 2016 annual filing – Page 25, Note 14: *"Rental of equipment and intellectual property from MBE Technologies (sic) Pte Ltd, [2016] [SGD] $5,516,000, [2015] [SGD] $2,740,000."*

[60] As highlighted prior, the year end for these respective companies is aligned at 31 December. We would highlight that as per note 58, that CSDC's filings have contained other apparent clerical errors or typos.

[61] MBE Technology Pte Ltd 2016 annual filing – Page 32, Note 17.

[62] Please note that whereas the name reported for its annual filings is, MBE **Technology** Pte Ltd, when the company is mentioned in the CSDC JV accounts it is regularly referred to as MBE **Technologies** Pte Ltd. This may be a clerical error/typo by the companies involved.

[63] CSDC Private Limited (Singapore) 2016 annual filing – Page 25, Note 14

For example:

- When CSDC reported c. £6.1 million in purchases from MBE in 2015, CSDC's trade payables due to MBE were c. £1.2 million; i.e. equivalent to 19% of the reported purchases.

Then:

- By 2016, whereas the CSDC annual filing indicates that CSDC reported c. £3.0 million in purchases from MBE, when it came to trade payables due from CSDC to MBE, these had risen to c. £4.6 million. Hence, CSDC's trade payables due to MBE were equivalent to 156% of the purchases it is reported to have made from MBE.

	FX Rate to GBP £	*2.0871*	*2.1011*	*1.8710*
		SGD $	SGD $	SGD $
MBE Technology Pte Ltd		**2014**	**2015**	**2016**
Revenue	S$, m	**15.4**	**13.8**	**13.3**
of which sales to CSDC JV	S$, m		*10.2*	
of which rental of equipment and IP to CSDC JV	S$, m		*2.7*	*5.5*
Sales and rental of equipment and IP by MBE to CSDC JV	*S$, m*		***12.9***	***5.5***
Sales and rental of equipment and IP by MBE to CSDC JV as % of MBE's total revenue	**%**		**93.3%**	**41.6%**
Trade payables from the CSDC JV due to MBE	S$, m		***2.5***	***8.6***
Trade payables from the CSDC JV due to MBE as a % of MBE's sales and rental of equipment and IP to CSDC JV	%		**19.4%**	**155.8%**

		GBP £	GBP £	GBP £
MBE Technology Pte Ltd		**2014**	**2015**	**2016**
Revenue	£m	**7.4**	**6.6**	**7.1**
of which sales to CSDC JV	*£m*		*4.8*	*0.0*
of which rental of equipment and IP to CSDC JV	*£m*		*1.3*	*2.9*
Sales and rental of equipment and IP by MBE to CSDC JV	*£m*		***6.1***	***2.9***
Sales and rental of equipment and IP by MBE to CSDC JV as % of MBE's total revenue	%		**93.3%**	**41.6%**
Trade payables from the CSDC JV due to MBE	£m		***1.2***	***4.6***
Trade payables from the CSDC JV due to MBE as a % of MBE's sales and rental of equipment and IP to CSDC JV	%		**19.4%**	**155.8%**

Figure 31 MBE Technology Pte Ltd revenue as compared to trade payables due to MBE from CSDC Private Limited (Singapore)
Source: MBE Technology and CSDC Private Limited (Singapore) annual filings

Although CSDC reported purchasing c. £2.9m in rental equipment and IP from MBE in 2016, somewhat strangely the payables it reported as owed to MBE rose to c. £4.6m.

I.e. CSDC's payables were 156% of what it states its purchases were from MBE in 2016.

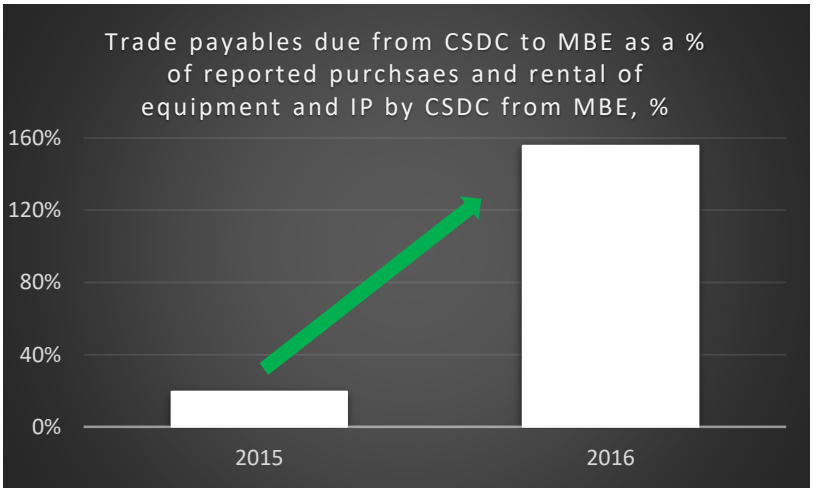

Figure 32 CSDC's purchases from MBE Technology as compared to its trade payables due to MBE, %
Source: CSDC Private Limited (Singapore) and MBE Technology Pte Ltd annual filings

Somehow there appears to be an irreconcilable c. £2.1 million in Singapore

In relation to the reported trade receivables and payables balances, we are again unable to reconcile the accounts of CSDC Private Limited with those of its joint controlling company, MBE[64].

According to the CSDC's 2016 annual filing, within its trade and other payables balance, it reported SGD $8,592,526 (GBP £4,592,968[65]) as the *"Amount due to immediate holding company – MBET"*[66]. However, when it comes to MBET's 2016 annual filing, within its trade and other receivables balance, it reported SGD $3,420,000 (GBP £1,827,900[67]) as the *"amounts due from joint venture"*[68]. Likewise, for 2015, CSDC reported SGD $2,508,400 (GBP £1,193,851[69]) as due to MBE. By contrast, MBE reported SGD $220,000 (GBP £104,707[70]) as *"amounts due from joint venture"*.

Somehow, in 2016, there appears to be an irreconcilable c. £2.1 million in Singapore[71].

CSDC reports a balance of c. £4.0 million in net trade payables due to MBE in 2016.

By contrast, MBE reports a balance of c. £1.8 million in net receivables due from CSDC in 2016.

I.e. CSDC is claiming it owes MBE c. £2.1 million more than what MBE is claiming it is owed by CSDC.

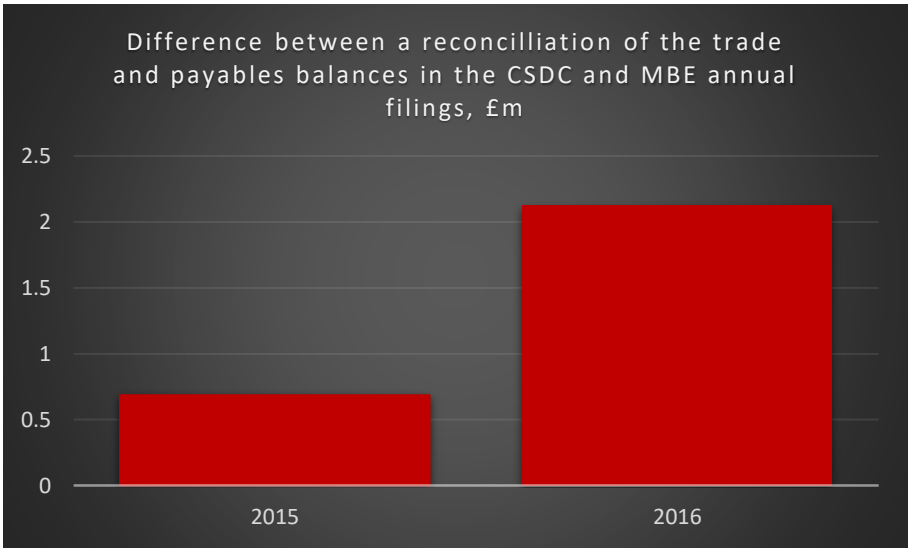

Figure 33 Balance of the difference between net trade receivables and payables reported by CSDC and MBE as due to each entity.
Source: CSDC Private Limited (Singapore) and MBE Technology Pte Ltd annual filings

[64] MBE Technology PTE Ltd 2016 annual filing – Page 11, Note 9 – states that *"The Company [MBE Technology PTE Ltd] is a wholly-owned subsidiary of IQE plc."*
[65] Exchange rate used of SGD:GBP 1.8708
[66] CSDC Private Limited 2016 annual filing – Page 12, Note 1- states that: *"The Company [CSDC Private Limited] is jointly controlled by MBE Technology PTE Ltd ("MBET"), WIN Semiconductors Corp and NTU."*
[67] Exchange rate used of SGD:GBP 1.8708
[68] MBE Technology PTE Ltd 2016 annual filings – Page 26, Note 9 – states "Investment in joint ventures" CSDC Private Limited (Singapore) as the joint venture.
[69] Exchange rate used of SGD:GBP 2.1011
[70] ibid
[71] We estimate this as the difference between what CSDC states it owes MBET and what MBET states it is owed from CSDC, i.e. the £3,954,735 less £1,827,900. FX rates used as per those detailed in figure 29. In the context of IQE's current market valuation this is not a sizeable figure. However in relation to IQE's reported profits and free cash flow a c. £2.1 million apparent discrepancy seems to us to be more significant, and we believe is supportive of our concern regarding the group's corporate governance.

Reconcilliation between the 2016 annual filings of CSDC Private (Singapore) and MBE Technologies PTE Ltd

	FX Rate to GBP £	*2.1011*	*1.8710*
		SGD $	SGD $
CSDC Filing		**2015**	**2016**
Trade receivables due to the CSDC JV from MBE		848,502	1,193,217
Trade payables of the CSDC JV due to MBE		2,508,400	8,592,526
Net trade payables due from the CSDC JV to MBE		**1,659,898**	**7,399,309**
MBE Filing			
Trade receivables due to MBE from the CSDC JV		220,000	3,420,000
Trade payables due from MBE to the CSDC JV^		0	0
Net trade receivables due from the CSDC JV to MBE		**220,000**	**3,420,000**
Discrepancy		**1,439,898**	**3,979,309**

^The MBET 2016 annual filing makes no mention of trade payables that are due to its CSDC joint venture.

Reconcilliation between the 2016 annual filings of CSDC Private (Singapore) and MBE Technologies PTE Ltd

		GBP £	GBP £
CSDC Filing		**2015**	**2016**
Trade receivables due to the CSDC JV from MBE		403,837	637,743
Trade payables of the CSDC JV due to MBE		1,193,851	4,592,478
Net trade payables due from the CSDC JV to MBE		**790,014**	**3,954,735**
MBE Filing			
Trade receivables due to MBE from the CSDC JV		104,707	1,827,900
Trade payables due from MBE to the CSDC JV^		0	0
Net trade receivables due from the CSDC JV to MBE		**104,707**	**1,827,900**
Discrepancy		**685,307**	**2,126,835**

^The MBET 2016 annual filing makes no mention of trade payables that are due to its CSDC joint venture.

Figure 34 ShadowFall's reconciliation of CSDC Private (Singapore) and its JV owner's, MBE Technologies, 2016 annual filings
Source: CSDC Private Limited (Singapore) and MBE Technology Pte Ltd annual filings