

#### Stock Data

Share Price:	22.00p
Market Cap:	£71.37m
Shares in issue:	324.42m
52-week high/low:	24.42p/15.19p

#### Company Profile

Sector:	Technology
Ticker:	NANO
Exchange:	LSE

#### Activities

Nanoco Group plc ('Nanoco', 'NANO', 'the Group') harnesses the power of nanomaterials. These are materials with dimensions typically in the range 1 - 100 nm. Nanomaterials have a range of useful properties, including optical and electronic. Nanoco is listed on the Main Market of the London Stock Exchange.

[www.nanocotechnologies.com/](http://www.nanocotechnologies.com/)

#### 5-year share price performance



Source: [LSE](http://LSE)

Past performance is not an indication of future performance.

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## Nanoco Group plc

Nanoco yesterday released its half year results to 31 January 2024 ('the Period'). Very much in line with expectations, these following confirmation of the Group's Final Litigation proceeds earlier this month along with a proposal to shortly return up to £33m to Shareholders (the 'Return of Value', abbreviated remaining timetable below). Emerging from this, the Group finds itself positioned as a fully funded business with commercial traction, investing to secure organic growth that is supported through extensive and validated IP. Given that the coming five years are projected to deliver global CAGR of over 40% and c. 20% resp. across its core sensing (cameras and imagers) and display markets, in tandem with wider adoption of QD technology in mobile phones and small screen micro-LEDs that are also anticipated over this period, the scale of Nanoco's addressable opportunity looks set to expand sharply. Finding itself debt free (by the end of FY2023/24) while holding resources sufficient to carry it through to expected cash breakeven during CY2025, it remains particularly surprising that Nanoco's equity continues to price-in so very little for its almost unique positioning/product offering that has already secured commercial orders while continuing to advance collaborations with two global electronics supply-chain customers.

### Tender Offer – Abbreviated remaining Timetable

Corporate Action	Date
Announcement of the results of the GM	28 March 2024
Latest time and date for receipt of Tender Forms and share certificates (i.e. close of the Tender Offer)	1.00 p.m. on 9 April 2024
Latest time and date for settlement of TTE Instruction for tendered uncertificated Ordinary Shares	1.00 p.m. on 9 April 2024
Record Date for the Tender Offer	6.00 p.m. on 9 April 2024
Announcement of the results of the Tender Offer	11 April 2024

Source: Nanoco, [RNS of 11 March 2024](http://RNS of 11 March 2024)

#### Notes:

- Only those shareholders on the Register of Members at 6.00 p.m. on 9 April 2024 are eligible to participate in the Tender Offer;  
Excess demand will be scaled back on a pro rata basis (save that tenders from Shareholders who hold 2,000 ordinary shares or less will be accepted in full subject to there being capacity to purchase those Ordinary Shares in accordance with the terms of the Tender Offer);
- Nanoco intends to cancel c.90% of the ordinary shares acquired in connection with the Return of Value;
- The remaining c.10% balance of the ordinary shares which are not cancelled from treasury to the Nanoco Employee Benefit Trust to meet potential future obligations which may arise from the Group's share option schemes.

### H1 FY2023/24 – Trading in line with Board expectations

- Reported revenue increased to £4.0m (H1 FY23: £1.6m) driven by recurring IP licence revenue.
  - Underlying revenue (excluding Samsung licence revenue) of £1.0m, (H1 FY2023/24: £1.6m). Decrease reflects timing of STMicroelectronics agreement being signed towards the end of the Period.
- Reported operating profit increased to a profit of £2.4m (H1 FY23: loss £2.1m) reflecting increased revenue and the FX hedge gain of £2.5m in relation to second tranche of proceeds from Samsung, partly offset by strategic investments.

- Adjusted EBITDA of £0.7m (H1 FY23: LBITDA £1.1m) excludes the one-off impact of the FX hedge gain and share-based payments.
- Investment in operations has increased gross cash cost base to c. £0.6m per month (H1 FY23: £0.5m).
- Period end reported cash of £59.3m (£2.5m FX hedge benefit received in February 2024).
- The planned return of capital to shareholders (the 'Return of Value') and repayment of outstanding debt of c.£5m will leave a cash balance of c.£23m to support the commercial business.

## Use of retained proceeds

Post FX hedging, the second tranche of proceeds from the Samsung agreements totalled US\$71.75m although, due to the instrument's scheduled maturity, this is reported as unrealised in the period end accounts. The Group nevertheless had a cash balance as of 31 January 2024 of £59.3m (2023: £6.0m). Having incurred a one-off tax charge in FY2022/23 due to the profits exceeding the restriction on the use of brought forward losses, tax payable of £0.8m remained. The Korean withholding tax on the Samsung licence agreement now creates a UK tax asset of £4.6m, however, which can be offset against future tax liabilities (£0.3m of which has been charged against current period profits). Following the completion of the £33.0 million return of capital to shareholders, and after allowing for the repayment of the Group's outstanding debt of c.£5 million plus remaining cash reserves from the first tranche of litigation proceeds, Nanoco expects to have c.£23 million of cash available to support the commercial business. As such, Nanoco now finds itself in the strongest commercial and financial position in its history.

The Board remains confident that near-term opportunities fully merit the allocation of the available funds, particularly for growing commercial production of sensing materials, together with the current interest in the Group's display materials following the IP litigation and the expanding display market for CFQD<sup>®</sup> cadmium free quantum dots. As outlined in the circular issued on 20 June 2023, the Board intends to use the retained funds to invest as follows:

- Investment in the Group's production capability to enable further production efficiencies and expansion of its gross profit margin as it continues to transition from a pure-play R&D first mover towards a commercial producer of nanomaterials at scale;
- Investing to accelerate a number of promising R&D projects focused on developing new second and further generation sensing materials;
- Expanding the Runcorn facility to facilitate the Group's capability to manufacture wafer scale sensing devices in order to enhance business development and analytical services;
- Funding the Group's commercial business activities until they become self-financing, something that the Board expects to be achieved during the calendar year 2025;
- Self-funding the early stages of its IP portfolio licensing programme. These efforts are in support of the Group's overall commercial goals, being able to also mitigate the downside impact on returns that might arise through the use of licencing agents or third-party funding; and
- The Board is keen to ensure to the fullest extent possible that Nanoco does not need to return to the capital markets for funding in the foreseeable future or before the adoption of the Group's technology in high volume consumer electronics applications. Its blue-chip global partners and potential new customers can be expected to take comfort from a more robust balance sheet.

## Entering a new phase of its development

The Board now believes Nanoco has entered a new phase of its development and remains confident in its future growth prospects. Factors supporting this expectation are detailed below:

- Nanoco has successfully fulfilled its first commercial production orders for two new materials for use in infra-red sensing applications in electronic devices;

- The Group has a diverse portfolio of second and further generation nanomaterial development projects underway with some of the world's most respected electronics supply chain companies, presenting a compelling pipeline of organic growth opportunities;
- Patents protecting the Group's key display and sensing technologies were validated during the Samsung litigation by the US Patent Trial and Appeal Board ('PTAB'), as a result of which Samsung felt compelled to take out a licence over Nanoco's relevant IP, with further licensing efforts continuing in anticipation of supporting future commercial opportunities; and
- Nanoco is now fully funded and in the strongest financial position in its history following the receipt of the Final Litigation proceeds.

## First half recorded strategic progress towards commercial production at scale

Nanoco's half year results to 31 January 2024 confirmed details already noted in the Group's Trading Update of 8 February 2024 and remained in line with the Board's expectations. A critical milestone was passed with the achievement of first ever commercial orders, with shipment in November 2023 of two first-generation materials for use in infra-red sensing applications in electronic devices (cameras and imagers), while also confirming significant continuing progress with the Group's two global electronics supply chain customers:

- Joint Development Agreement with STMicroelectronics, a global semiconductor leader serving customers across the spectrum of electronics applications, to optimise the performance of a second-generation sensing material over a two-year period.
- Joint Development Agreement signed in November 2023 with an important Asian Chemical supplier of materials to global electronics supply chains over two years to enhance another high performing sensing material.

Operational progress also included the building and fit out completed post period end for the Group's new 200-300mm wafer device development and testing facility ('Fab') to shorten product research cycles by up to c.33% and to support engagement with new and existing customers. A new device team joined early in the second half, which is presently commissioning recently arrived equipment.

## Display (CFQD<sup>®</sup> quantum dots) – Nanoco positioned to seize the true opportunity of its IP

Nanoco continues to adopt a dual approach to commercial exploitation of its display materials, through both licencing and material supply from its own manufacturing capability. As reported previously, the Group is also working on a reactive basis to opportunities in adjacent markets such as horticultural and lighting applications.

Not surprisingly, activity and new inbound enquiries about display materials have expanded following the Group's success with its patents at the PTAB and the final outcome to the litigation. In anticipation of this, it has already taken a number of important first steps for further potential licensing of its IP; these include identifying potential infringers and associated devices, analysing those devices, and engaging with companies who may want or need to take a license over Nanoco IP. Early-stage engagement continues with potential new display customers.

In financial terms this may take some time to deliver, but an expanding range of products/applications along with a number of display manufacturers choosing to anticipate prospective legislative enforcement of cadmium-free solutions through the Restriction of Hazardous Substances ('RoHS') Directive 2002/95/EC, suggests both an expanding market and longer-term opportunity. Supported by conclusions from [independent market research](#) that forecast a continuing fall in Samsung's dominant share of the global flat-screen market while QDs are projected to expand from c.6% in 2022 to c.34% by 2030 due to their enhanced colour and efficiency versus LCDs, this is seen creating important opportunities for Nanoco. It prospectively represents a rise from c.2m non-Samsung, non-cadmium screens to c.70m units. Having already validated its IP for mass production, the Group's ability to service its prospective customers is further supported as follows:

1. As a manufacturer of cadmium free quantum dots, its Runcorn facility can be readily expanded; and

2. As the owner of a validated IP portfolio and process know how which is fundamental to the manufacture of cadmium free quantum dots on an industrial scale.

Beyond the flat panel market, application of quantum dots to micro-LEDs for small screen devices, such as smart watches or phones, is becoming a new and potentially important focus for a number of industry participants. In such applications, the volume of quantum dots, as a ratio to the area covered, is significantly higher than in a film for a television. So, while the end devices may be smaller, this is partly compensated for by the higher concentration level for quantum dots required by those devices. Recognising that substantial development of QDs is still required to fully satisfy the needs of such prospective customers and to accelerate breakthrough adoptions, the Group has created a QD Display Technology Roadmap to support its research in future QD- $\mu$ LED market opportunities.

As such, Nanoco is well positioned to take advantage of any broadening in the adoption of non-toxic quantum dots by global display manufacturers when the opportunity arises. Moreover, the experience of reaching a settlement and licence agreement with Samsung clearly demonstrated the user's need to access its IP and technology. Having created a 'landscape of potential infringers', comprising a universe of 16 volume producers, two have been identified amongst the first eight to be assessed as presently offering cadmium-free QDs.

Although this does not 'prove' infringement, private discussions with these parties have (or are about to) commenced with a view to potentially reaching a licencing agreement, while the fallback option of reverting to litigation remains should the parties choose not to cooperate. Management has guided not to expect any concrete results before the end of CY2024. It seems increasingly likely that existing/prospective violators who might in the past have chosen to incorporate the Group's patented IP without first entering into either a licence or material supply agreement, will now be dissuaded from such action due to the strength of Nanoco's balance sheet and its declared option to self-fund (based on risk-reward) their vigorous pursuit.

### **Sensing Electronics - Achieved all development, scale up and readiness milestones**

Nanoco principally targets camera and imager opportunities within the total CMOS Image Sensor market ('CIS'). The wide range of potential end use applications for Nanoco materials reflects a key strength and the underpinning IP; being a 'platform technology' that is applicable to a large number of markets, applications and form factors.

Research group, [Mordor Intelligence](#), forecasts 2028 value of c.US\$650m (2022: US\$97m) for imagers and US\$2,900m (2022: US\$322m) for cameras, by when the overall CIS market is expected to reach US\$30bn. This projection anticipates multiple end-use sensor applications, including broad adoption of short-wave infrared by high volume mobile phone manufacturers by 2026, which is expected to support the drive for consumer devices representing 70% of the camera market over the following two years. Given the numerous advantages QDs bring to silicon (most specifically in terms of a six-fold increase in near-infrared ('NIR') efficiency and the exceptionally high cost of alternate indium gallium arsenide ('InGaAs') products), they appear to be well positioned for breakthrough adoption.

The Group's existing European (high-volume potential) and Asian (mid-volume potential) customers operate in large global markets, wherein final customer adoption of QD CMOS sensing technology could lead to significant revenue growth for Nanoco. Having already committed significant investment in Nanoco materials as part of their production and marketing efforts, this view appears to be strongly supported. For its part, Nanoco already has created the flexibility, capability and capacity to meet whatever scale of demand requirement they might require. Validation of its IP in the Samsung litigation process is also relevant for sensing applications, reflecting the fact that its scale-up IP is applicable to both technologies and of interest to major sector players through to tech start-ups. Nanoco is aiming to add a further large QD player (high volume potential) during the current financial year.

Processes for two sensing materials have been successfully scaled-up to industrial production levels for consumer electronics. Both have now seen fulfilled commercial production orders. Two new second generation materials have passed the 'proof of concept' stage. Although, as noted previously, the size of the first production order for the materials in final validation was modest in scale (see RNS of 15 November 2023), this nevertheless represented a major milestone for the Group's technology and production capacity, with scope for broader and, potentially, longer-

term adoption. Progress was also made throughout the year on a number of sequential short term development projects for the Group's major Asian chemical customer.

Material performance has exceeded challenging expectations and a new two-year development agreement was signed in H1 FY2023/24. In order to remain at the forefront of technological development for QDs and address the needs of its customer base, Nanoco is developing new advanced material systems based on patented seeding technology. Having based its first image sensor products on lead (Pb), next generations products with superior electrical properties, including Indium Antimonide (InSb) and Indium Arsenide (InAs), along with greater chemical and thermal stability etc.

During the Period, the Group completed two small but important projects that were part funded by Innovate UK, the UK's innovation agency. One of those projects was targeting a third generation sensing material with the potential for even more advanced performance. The second of these projects concerns the creation of novel nanomaterials that are potentially applicable in the field of quantum computing. Discussions are ongoing regarding further investment in these areas.

It is recognised that relatively slow adoption of nanomaterial technology creates commercial challenges for both Nanoco and its competitors. Shareholders will be aware that development cycles for new advanced materials for use in consumer electronics can be particularly extended with, for example, Samsung known to be working with quantum dots for over ten years before commercialising the technology. Such development cycles tend to be long because the supply chain often needs to be re-engineered on top of developing QD material. In this respect, one of the advantages of the QD-enhanced CMOS sensors that the Group specialises in, is that the material represents an extra layer in a pre-existing material stack. Reaching final product validation testing within six years demonstrates Nanoco's clear ability to develop and scale novel materials to the exacting standards required for consumer electronics applications in what is, in fact, a relatively short time frame. For exactly the same reasons, once adopted the technology tends to be 'very sticky', ensuring long-run, high margin supply agreements.

### **Very little priced in for the Board's confidence it will become self-financing during 2025**

Nanoco's market value presently stands at only a c.20% premium to the final litigation cash proceeds. Recognising that the Group retains carried forward losses well in excess of £30m (having already utilised £10m) to minimise the tax liability from the settlement, it remains surprising that the market continues to price in so very little for the Board's stated expectation that it will become a self-financing producer of high performing nanomaterials during CY2025. Anticipated progress during the remainder of 2H FY2023/24 includes additional low volume production orders along with new materials development contracts. Given that the benefit/additional flexibility derived from commissioning of the enhanced wafer device fabrication plant in Runcorn are now coming on stream, the Group's ability to markedly accelerate production of new QD material developments that targeting customers operating in both the sensing and display markets should advance opportunity for breakthrough adoption of the technology in high volume consumer devices. The long-term financial benefits of this for shareholders will be considerable.

Recognising management's confidence in its technological capabilities/validated IP and its ability to exploit the longer-term opportunities these present, retained funds will therefore be directed, amongst other things, toward enhancing and automating production capacity and eliminating debt, while expanding marketing amongst what is a relatively limited number of very large existing and potential customers.

The Board expects its business model to become self-sustaining during the next calendar year, including its ongoing ability to self-finance rapid follow-up of all/any further IP infringements without recourse to investors or assuming new leverage. Given its success in rigorously defending Nanoco's technologies while continuing to develop its global opportunities and market position, the market might be expected to more realistically value its comprehensive IP and confidence in commercial production expanding significantly going forward, while it also almost uniquely addresses the potentially very large long-term, expanding opportunities for CFQD® cadmium free quantum dots in the international sensing materials and the display markets.

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