



# **CrayoNano**

# **Q4 2022 presentation**

**16 February 2023**

Disrupting the fast growing markets for disinfection



## Presenters today



**Jo Uthus**

CEO



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CFO



# Q4 Strategic Update



# About CrayoNano

- Global presence with headquarters in **Norway** and facilities in **Taiwan**
- Pioneers in **nanotechnology**-based **semiconductor** components
- **Strong technology IP** portfolio with **266 patents** (97 granted, 169 licensed from partner)
- Enabling Environmental, Social and corporate Governance (**ESG**) solutions with our partners
- Our first product line of **radically efficient UV-C LEDs** are vital components for the **fast-growing** disinfection markets
- **Fab-lite** business model utilising global supply chain





# Q4 Highlights

**In Q4 we continued to deliver on our mission to develop nanomaterial-based semiconductors that contribute to solutions toward global environment and health challenges**

## **Successful launch of our first product**

- On 6 October 2022, we launched the CrayoLED™, an ultraviolet-C light emitting diode (UV-C LED) semiconductor packaged component

## **First revenue booked**

- CrayoNano generated first commercial revenue from the sale of initial test units to customers with further demand for our product remaining strong

## **Operational ramp up**

- Testing of our production yields continues to ensure final production quality

## **Taiwanese operations**

- Completion of our 'Fab2' commission on budget as we transition to our 'fab-lite' operating model

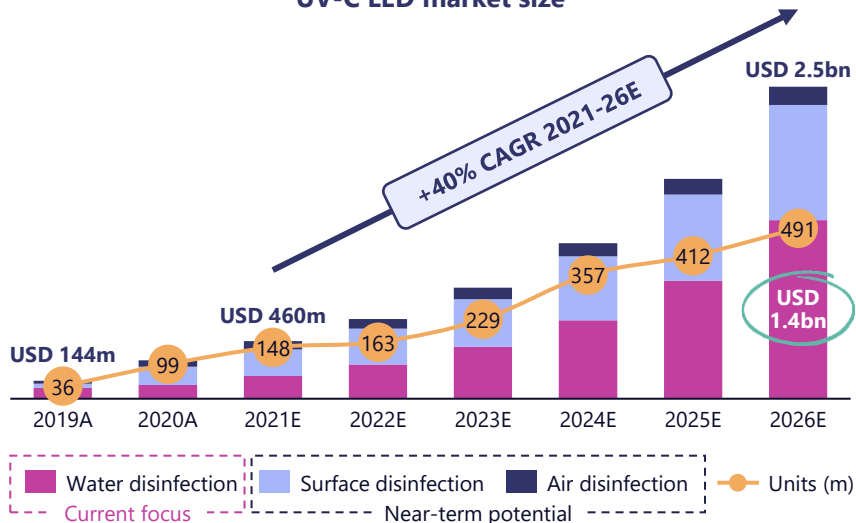
## **Private placement update**

- Ongoing plans to complete our planned private placement, followed by a listing on the Euronext Growth market



# UV-C LED market estimated growth of 40% CAGR to \$2.5bn by 2026

### UV-C LED market size



### Market segments



#### Water disinfection

Existing water treatments often use hazardous chemicals, while the UV-C LED solution is a clean, environmentally friendly alternative



#### Surface disinfection

In high contact and trafficked areas, UV-C LED can enable an automatised disinfecting solution that provide a safe environment to meet and interact in



#### Air disinfection

Small, compact UV-C LEDs can eliminate airborne pathogens and other causing bacteria, making multi-family housing and shared workplaces safer

### Drivers for UV LED integration – UV disinfection

Environmentally-friendly

Low power consumption

Instant start and stop

Compactness and lightweight

Longer lifetime

No heat emitted

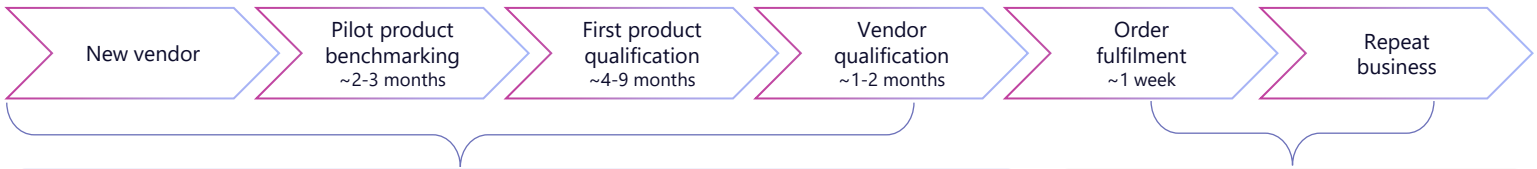
UV-C disinfection dates back to 1910, and used on a bigger scale since the mid 1950s

Note: Segment splits are management estimates based on the Yole Development Report for 2020 | Source: Yole Development Report (2021) and management estimates



# Structured sales process

## Standard customer qualification and design-in process



### Typical qualification & design win timeline – 5-12 months

- 1  
Sample Testing  
~ 1 months
- 2  
Product Qualification  
3 – 9 months
- 3  
Design Win Qualification  
1 – 2 months

### CrayoNano's revenue operations (RevOps)

Holistic customer orientation  
Sales / marketing / customers operations + Data  
The three teams work together as one unit to work with data, which fuels the RevOps strategy

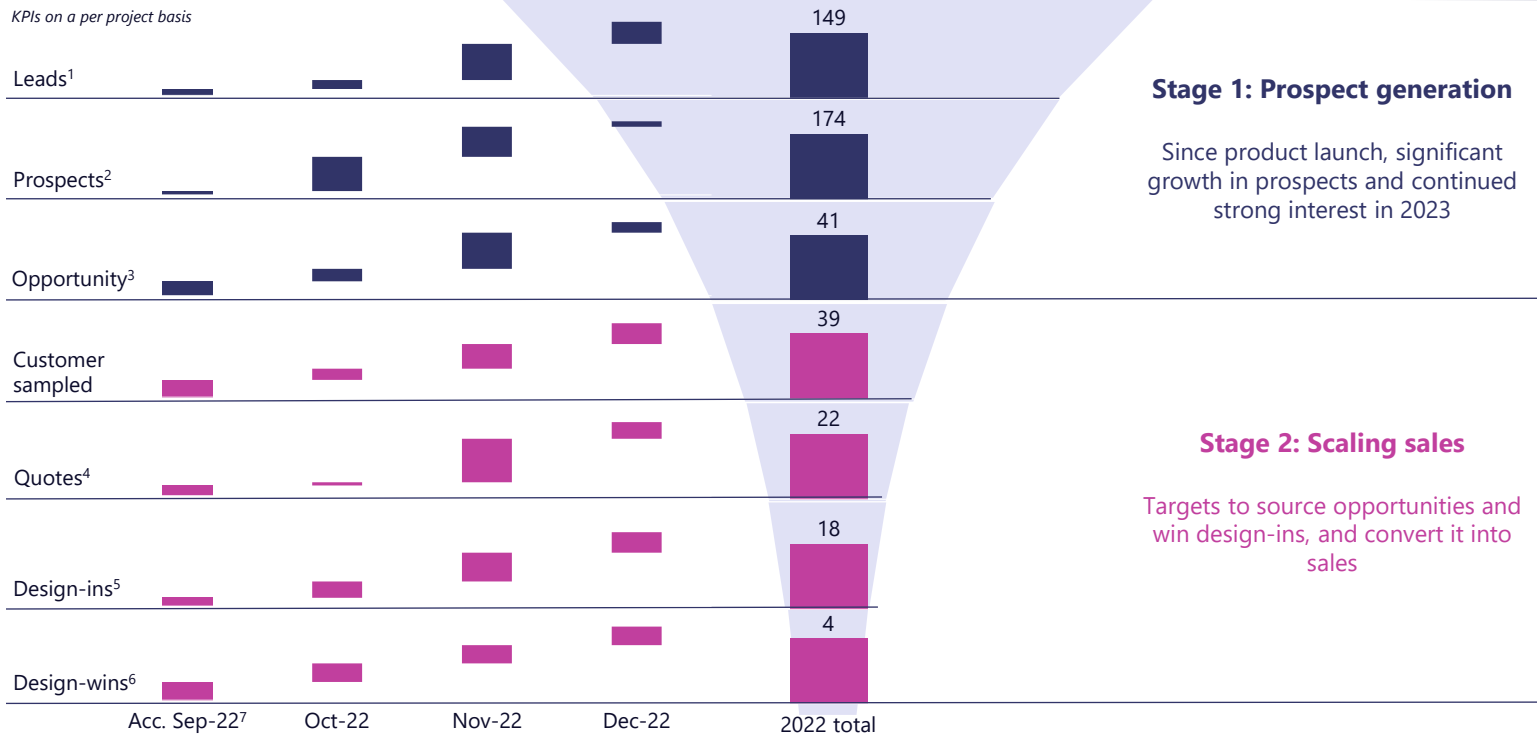
**ORACLE  
NETSUITE**

Close customer follow-up  
Netsuite's ERP/CRM system went live on July 1<sup>st</sup> with customer pipeline including forecast and opportunities implemented



# Strong customer demand in Q4, supporting 2023 targets

KPIs on a per project basis



## Stage 1: Prospect generation

Since product launch, significant growth in prospects and continued strong interest in 2023

## Stage 2: Scaling sales

Targets to source opportunities and win design-ins, and convert it into sales

Strong attraction in Q4'22 post product launch, creating basis for 2023 targets

Note: <sup>1</sup> Leads – a new company with an interest in CrayoNano, <sup>2</sup> Prospect – a qualified lead with potential to become a customer or opportunity, <sup>3</sup> Opportunity – a prospect who we have discovered has potential quantifiable business with CrayoNano, <sup>4</sup> Quotes – budgetary quotes, <sup>5</sup> Design-in – customer is engineering, qualifying and performing next steps to incorporate CrayoNano into their product, <sup>6</sup> Design-wins with small volumes, <sup>7</sup> Accumulated until September 2022





# Key examples of CrayoLED™ design-ins for 2023

## Water



### Residential drinking water



### Residential white goods



### Consumer drinking water



### Municipal water treatment



## Surface and Air



### Industrial devices



### Air conditioning/ HVAC



### Air purifiers



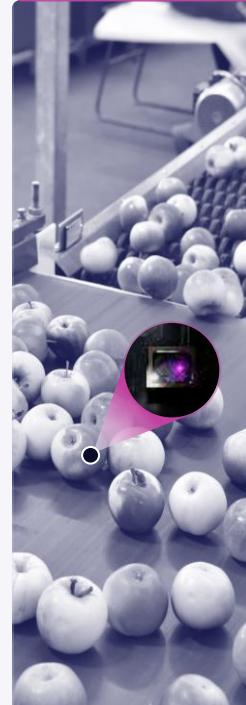
### Public transportation



### Spot disinfection



## Curing



### Printing



### Food packaging



Expect to ship 1 million pieces in 2023

Note: 1 Estimated annual average volume per project based on information from customers, 2 Production start as of when first project expected to materialise | Source: Customer estimates and CrayoNano assumptions



# Positive customer feedback

CrayoLED™ LED samples distributed to target customer groups

	CrayoLED™ H-series performance
Power	80mW
Lifetime reliability	L70 10,000hrs
Small footprint	3.5x3.5mm
Wavelength	275nm
Forward current	350mA

## CrayoLED™ H-series customer feedback

"CrayoLED™ initial testing results are **impressive**. Power and Voltage are matching the specs. 3<sup>rd</sup> party qualification highly appreciated" by tier-1 water disinfection OEM customer (US)

"CrayoNano, being a UV-C focused company is critical for us. Initial test results are good in terms of measurements and specs" by tier-1 water POE customer (UK)

"H-series is a **highly robust and reliable** UV-C LED with solid package." by tier-1 system integrator (Taiwan)

"Would like to utilize **CrayoLED in the product & promote it in India consumer market.**" by tier-1 ODM (India)

"We have been waiting for the transitional time since the early UV-C and we **finally see it with your LED.**" by tier-2 OEM (US)

"We are buying other UVC LEDs right now. **The output of H-series is higher and lifetime is the same.** Price is similar too." by semiconductor Tier-1 customer

"Your **technical specification** in small, standardised form-factor and long life-time is already **taking UV-C LEDs one step further beyond your competitors**" – by Tier 1 customer



# CrayoNano Taiwan Fab2 – enabling our fab-lite strategy

## Fab-lite strategy

Own R&D lab in Norway



CrayoNano wafer fab + partner foundry in Taiwan

**3,000m<sup>2</sup>**

available for in-house development in partner foundry, 500m<sup>2</sup> dedicated to CrayoNano fab2

**Lower time to market**

allows CrayoNano to focus on cost optimisation and control of the supply chain and intellectual property

**Increased flexibility**

can lease 1 machine for NOK 2-300k/month – total manufacturing capacity of 20m units per year



## Taiwan key for accelerating fab-lite strategy



Increased activities toward Taiwan to scale operations



Geographically strategic for supply chain management

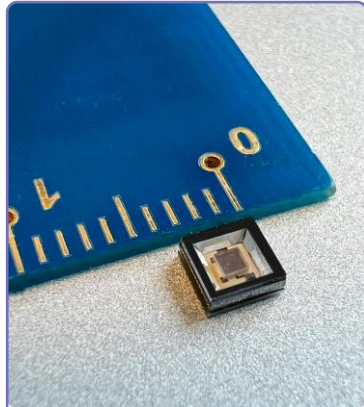


Concentration of semiconductor talent and industrial know-how



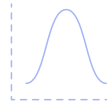


# CrayoLED™ UV-C LED Product Line



CrayoLED™ was developed together with key customers to target the water disinfection application

Clean UV-C output,  
High germicidal efficacy



High flux density  
3.5 x 3.5mm



Robust  
packaging



Parameter (Typical)	Symbol	Value	Unit
Peak Wavelength	$\lambda_p$	275	nm
Radiant Flux	$P_O$	80	mW
Forward Voltage	$V_F$	6	V
Spectrum Half-width	$\Delta\lambda$	11	nm
Viewing Angle	$2\Phi_{1/2}$	120	degrees
Thermal Resistance (junction – solder point)	$R_{\theta JS}$	6	K/W



*CrayoLED™ H-series (CLH-N3S) is available in both sample quantities and in stock for volume production*



# Financial Update



# Q4 2022 and full year Financial results

## Profit and loss

NOK million

	Q4 2022	Q4 2021	2022	2021
Sales revenue	0.2	0.0	0.4	0.0
Other revenue	0.2	2.0	7.6	8.3
<b>Revenue</b>	<b>0.4</b>	<b>2.0</b>	<b>8.0</b>	<b>8.3</b>
COGS	0.1	0.0	0.2	0.3
Payroll and related costs	6.4	8.6	35.0	27.3
Other operating costs	16.0	3.3	41.4	15.7
<b>EBITDA</b>	<b>-22.1</b>	<b>-9.9</b>	<b>-68.6</b>	<b>-34.9</b>
Depreciation & Amortization	2.1	1.5	7.3	6.0
<b>EBIT</b>	<b>-24.2</b>	<b>-11.4</b>	<b>-75.9</b>	<b>-40.9</b>
Net financial items	0.1	-0.1	-0.6	-0.2
<b>Net profit before tax</b>	<b>-24.1</b>	<b>-11.5</b>	<b>-76.5</b>	<b>-41.1</b>

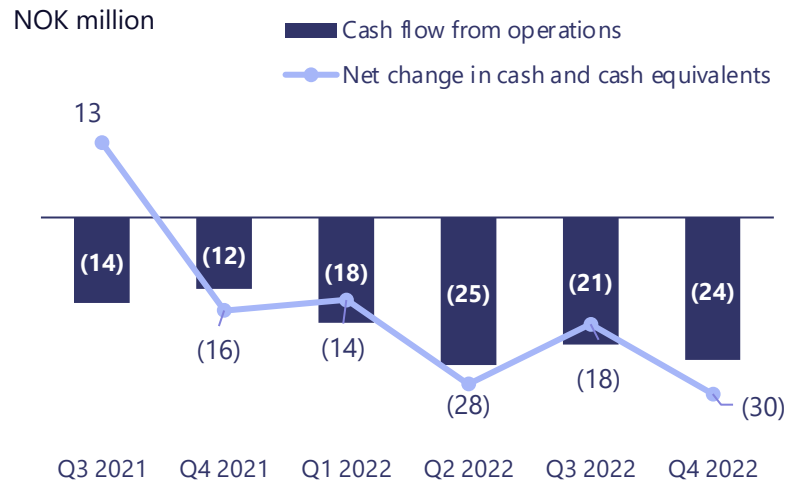
## Comments

- Sales revenue of NOK 0.2m in the quarter from initial pilot volume shipments to our first customers
- Total operating cost increased to 22.4m, up from 11.9m in Q4 2021, driven by an increase in strategic partner R&D activities, scaling of operations and Taiwan Fab2
- Negative EBITDA of NOK 22.1m in Q4 2022 compared to NOK 9.9m in Q4 2021



# Investing to support accelerated growth plan

## Quarterly cash flow development



## Comments

- Negative cash flow from operations of NOK 24.1m in the quarter, a spending increase of NOK 2.6m quarter-on-quarter and NOK 12m year-on-year
  - Started to build strategic inventory
  - Increased spending in Fab 2 related to the cleanroom installation, equipment and infrastructure
- Decrease in net change in cash and cash equivalents NOK 29.8m in Q4 2022 vs. NOK 18m in Q3 2022 and NOK 15.7m in Q4 2022
  - Increased investments in R&D and no public funding received in the quarter
- Cash balance at year-end of NOK 10.2m, shareholder loan of NOK 27.5 increased cash balance to NOK 28.4m at the end of January 2023



# Capital markets update

## Strong commitment

- Signed a loan agreement in January 2023 with our three largest shareholders totalling NOK 27.5m
- The loan will be converted to equity given successful private placement
- EIC fund signed term sheet of c.NOK 50m extended to 31<sup>st</sup> March 2023
- Cash balance of NOK 28.4m at the end of January

## Private placement

- Growth capital will be used to support the ongoing acceleration plan including high volume production
- Process expected to close soon, details to follow

## Listing Process / Euronext Growth update

- Prepared to list on Euronext Growth when the timing is right





## Q4 Key Takeaways

# Q4 key takeaways

## Ongoing commercial engagement

Reached out to 100+ customers [Customers point from op update]  
Positive feedback from customers [update]  
First revenue booked in the quarter and optimistic of the continued growth of product use and application

## Operational readiness and supply chain

Completion and commencement of operations of our 'Fab2' in Taiwan  
Built strategic inventory of products based on customer orders

## Funding our growth

Very strong commitments from 3 largest shareholders with NOK 27.5m loan converted to equity on equal terms in the placement  
Private Placement process ongoing, expected to close soon  
Euronext Growth markets listing to take place shortly thereafter



Q&A



# Appendix



# P&L

## Condensed profit and loss statement (unaudited)

	Q4	Q4	FY	FY
<i>(Figures in NOK thousands)</i>	2022	2021	2022	2021
Sales revenue	230	0	438	0
Other revenue and public grants	211	1 984	7 559	8 326
<b>Total revenues</b>	<b>441</b>	<b>1 984</b>	<b>7 997</b>	<b>8 326</b>
COGS	133	0	236	289
Payroll and related costs	6 412	8 635	34 993	27 260
Other operating costs	15 982	3 282	41 378	15 655
<b>EBITDA</b>	<b>-22 086</b>	<b>-9 933</b>	<b>-68 611</b>	<b>-34 879</b>
Depreciation	2 110	1 503	7 253	6 007
<b>EBIT</b>	<b>-24 196</b>	<b>-11 436</b>	<b>-75 864</b>	<b>-40 886</b>
Net financial items	52	- 60	- 633	- 215
<b>Net profit before tax</b>	<b>-24 144</b>	<b>-11 496</b>	<b>-76 497</b>	<b>-41 101</b>
Tax expense	-5 254	-3 223	-17 145	-9 737
<b>Net profit (loss)</b>	<b>-18 890</b>	<b>-8 273</b>	<b>-59 351</b>	<b>-31 364</b>
# shares in 1000	28 401	28 401	28 401	28 401
Earnings pr share (NOK)	-0.67	-0.29	-2.09	-1.10

Note: P&L presented is net of capitalized R&D



# Balance sheet

## Condensed balance sheet

(unaudited)

(Figures in NOK thousands)

	FY 31/12/2022	FY 31/12/2021
<b>Assets</b>		
Development, patents and licenses	64 692	58 581
Deferred tax assets	43 371	25 909
Tangible fixed assets	12 735	14 042
Financial fixed assets	1 059	2 061
<b>Total non-current assets</b>	<b>121 857</b>	<b>100 593</b>
<b>Current assets</b>		
Inventory	2 087	0
Trade and other receivables	16 896	6 093
Cash and cash equivalents	10 238	100 092
<b>Total current assets</b>	<b>29 221</b>	<b>106 185</b>
<b>Total assets</b>	<b>151 078</b>	<b>206 778</b>
<b>Equity and liabilities</b>		
<b>Equity</b>		
Share capital	568	568
Share premium account	104 665	234 362
Additional paid-in capital	2 596	2 596
Retained earnings	0	-69 224
<b>Total equity</b>	<b>107 829</b>	<b>168 302</b>
<b>Liabilities</b>		
Liabilities to finance institutions	8 073	10 593
Trade payables	9 239	3 518
Government charges	2 277	1 486
Other liabilities	23 659	22 878
<b>Total liabilities</b>	<b>43 249</b>	<b>38 476</b>
<b>Total equity and liabilities</b>	<b>151 078</b>	<b>206 778</b>

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