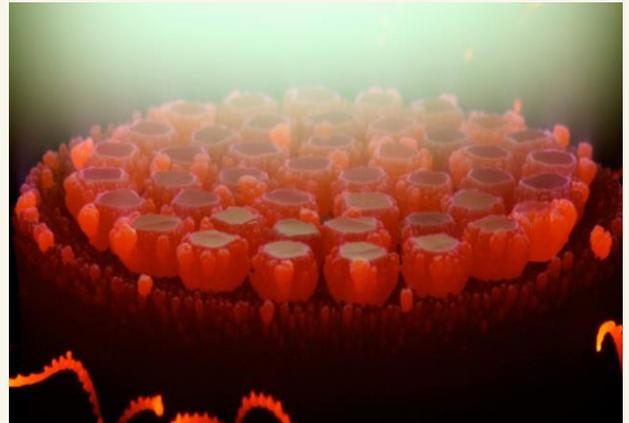


# HEYARU Engineering NV

*Advancing diamond fabrication beyond the gem industry and encouraging adoption of diamond in electronic, industrial, and medical applications.*

Fall 2021

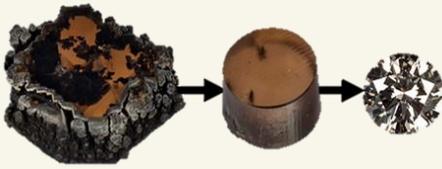


**HEYARU**  
CARBON REINVENTED

## Belgium: The leading diamond producer in Europe

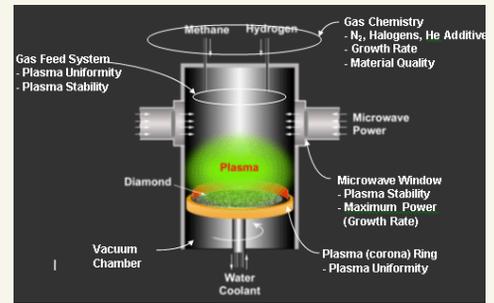
Lab-grown diamond (also referred to as synthetic diamond, laboratory-created diamond, manufactured diamond, man-made diamond, or cultured diamond) is diamond that is produced by a manufacturing process, as contrasted with natural diamond created by geological processes and extracted by mining.

Lab-grown diamonds are chemically and physically no different from natural diamonds. They should not be confused with diamond simulant, which is made of non-diamond material. Lab-grown diamonds are the same material as natural diamonds: pure carbon, crystallized in an isotropic 3D form. Vikram Shah, such a visionary that seeks to establish the largest Lab-grown diamond operation in Europe. right here in Belgium is planning a multiphase project over Five to Seven years culminating in a total investment in Belgium of \$400M, employing around 150 FTE's.



*Diamond from growth to polishing*

*Diamond Chemical Vapor Deposition (CVD) reactor*



*Diamond growth process*

## Belgium: The leading power electronics exporter in Europe

Silicon is rapidly approaching its limitations in the power electronics field. The explosive growth of high power applications such as electric vehicles, combined with the ever-increasing diversity in power generation methods (solar, wind, fuel cell, etc.) is driving the need for new semiconducting materials able to handle the high voltage, current and frequencies required for these applications. Since the 1950s, diamond has been seen as the ideal material for power electronics with material properties superior to even the most advanced silicon alternatives such as gallium nitride and silicon carbide. Until recently, a diamond's attractive material properties had been outweighed by the associated fabrication challenges. Ironically, the same gem industry that popularized it as a fashion symbol is pioneering new fabrication technologies for synthetic diamonds that are directly relevant to the realization of this material for a wide range of electronic and industrial applications.

Vikram Shah is unique in that he is looking beyond the gem industry, toward these electronic applications and have already established a collaboration with research centers working on Diamond applications. The first Belgium made diamond for gem application was announced in July 2020. Heyaru will continue to transition from the gem industry into power electronics over the next 5-10 years until it becomes the leading supplier of electronic grade diamond by 2030.

**Scalability:** Production capacity is linear and is increased by adding more reactors. In the first phase, Heyaru plans to have around 30 reactors scaling to 350 machines by Phase 3 with an estimated cap-ex of \$400 million within seven years. Heyaru also works closely with partners in the development of the next generation of reactors. This new reactor design will place Heyaru well ahead of its competitors by increasing production capacity from each reactor by 10x. Additionally, the ability to fabricate larger single crystal diamond wafers will allow for rapid entry into the semiconductor industry as they will be directly compatible with existing semiconductor manufacturing techniques.

### Five Year Financial Summary

<b>Cap-ex</b>	
<b>Cost to Company (\$000)</b>	<b>Total</b>
Equipment	<b>324,700</b>
Real Estate	<b>68,500</b>
<b>Totals</b>	<b>393,200</b>
<b>Direct Labour</b>	
	<b>Total</b>
<b>Total Employment</b>	<b><u>150</u></b>
<b>Average salary cost per FTE</b>	<b>77,500</b>
<b>P&amp;L Statement</b>	
<b>(\$000)</b>	<b>FY 2026</b>
<b>Total Revenue</b>	<b>200,000</b>
<b>EBITDA</b>	<b>78,000</b>



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## **Carbon Emissions:**

The difference in carbon emissions on lab-grown and mined diamonds is staggering. While a traditionally mined diamond produces more than 125 pounds of carbon for every single carat, grown diamonds emit just 6 pounds of carbon – a mere 4.8 percent of what mined diamonds produce.

Mined diamonds also produce more than 30 pounds of Sulphur oxide, while lab-grown diamonds produce none. “In terms of overall gaseous emissions, the growth process involves little or no emissions of significance,” Frost & Sullivan’s study reported.

In total, air emissions on a single carat of mined diamond are 1.5 billion times higher than those of a lab-grown one.

## **Water and Energy Usage:**

One of the biggest areas where mined and lab-grown diamonds differ is in their water usage. A mined diamond consumes more than 126 gallons of water per carat. Lab-grown diamonds, on the other hand, consume just 18 gallons. Mined diamonds also result in “constant discharge of wastewater and pollutants in surface water bodies,” according to a recent research study from Frost & Sullivan.

Energy wise, mined diamonds use 538.5 million joules per carat, while grown ones use 250 million. Much of the energy used in creating lab-grown diamonds is renewable.

## **Land Disruption and Waste Generated:**

For every carat of diamond that is mined via traditional methods, nearly 100 square feet of land is disturbed and more 5798 pounds of mineral waste is created. The mining also offsets delicate biodiversity balances and renders the land unusable – even once mining activities have ceased.

By comparison, lab-grown diamonds disrupt just 0.07 square feet of land per carat and only 1 pound of mineral waste. According to Frost & Sullivan’s study, diamond-growing facilities “are often located in areas that have a negligible impact on the environment and have almost no impact on biodiversity in the area of operation.

## **Human Impact:**

Diamond mining is a dangerous profession, and the industry has often been known for human rights violations, child labor and inhumane treatment of workers. As shown in movies like Blood Diamond and Beast of No Nation, mined diamonds are also often used as illegal currency to fund war and conflict-related activities throughout Africa.

Diamond mines are also vulnerable to collapse and explosion and workers often see increased cancer risk, hearing loss, lung problems, and other health issues as a result of their professions. In 2010, 33 miners in Chile were stuck below ground in a collapsed mine for 69 days.

All in all, mined diamonds result in 1 injury for every 1,000 workers annually, while lab-grown diamonds result in zero. The diamond mining industry also sees 80 days of lost work time (per 1,000 employees) every year due to injury.

**Introduction:** The Da Vinci group has created synthetic diamonds at its facility in India since 2012 and now seeks to expand production by locating a facility in Belgium. The planned Heyaru plant will be a state of the art, fully automated facility, manufacturing single crystal advance materials (diamonds) to be utilized in a wide range of high-end applications. The project expansion is planned in phases at Kristal Park, Lommel.

**Business Summary:** Mr. Vikram Shah is the founder and sole shareholder of Heyaru Technology FZE and Da Vinci Holdings headquartered in the UAE and Heyaru Belgium is a subsidiary of the UAE companies.

**Product/Services:** Initially Heyaru will focus on Gem applications & in later phases will produce the most highly sought after ultra high Ila category Industrial (diamonds) prized for their hardness, heat conductivity and optical properties. The single diamond crystals produced will meet or exceed the hardness and precision requirements of our clientele. Our ultra-high purity diamonds will be used into various applications such as gemstones, optical sensors, thermal, machining, and electronics.

**Target Market:** The Belgium facility's initial focus will be synthetic diamonds for gem applications as it is a well-defined, predicable market in which Shah has developed a prominent presence over the past several decades. As production reaches sufficient capacity to meet anticipated demands, direct marketing of synthetic diamonds for various industrial applications will commence towards companies like Bosch, Siemens, Infineon, Thales, Rofin, Melexis, Seagate, Attocube, ESA, NASA, Philips etc.

**Customers:** Heyaru is a B2B company and will focus more on selling Lab grown rough diamonds to her customers. The customers can further prepare the rough as per their needs. The first phase production based on the current available in-house technical know-how will be similar to the group's production in India. Leo Da Vinci (India) currently serves a limited number of clients. As production capacity grows we will expand sales. Approximately about 30% of the Belgium production is assumed to be sold to related parties.

**Sales/Marketing Strategy:** Initial product sales will be focused mostly on the gem industry. Raw, uncut diamonds will be exported to Mr. Shah's existing global operations for cutting, polishing, and distribution through well-established channels. Synthetic diamonds also have specialized applications in high precision technical products across multiple business sectors. Marketing and sales into industrial settings will begin immediately following the establishment of Belgium facility through a consultative process including joint R&D with clients to design and fabricate a product meeting unique specifications. Heyaru will leverage the resources and experience of its parent company, Leo Da Vinci (India) to collaboratively work with prospective customers in order to secure product sales.

**Business Model:** Heyaru will specialize in the high capacity production of synthetic diamonds utilizing reactor designs and recipes developed at the group to mass create high-quality diamonds at a lower cost than its competitors. Further, Heyaru will leverage the know-how and labor force available at the parent company for post-production analysis and quality assurance. Lastly, being located in Lommel, Belgium provides a stable, inexpensive supply of electricity as well as access to key supply chain partners due to the fact the Antwerp has been the world's Diamond center for over a century now.

**Competitors:** The main established players are Element Six (De Beers), Washington Diamonds, Ila Technologies, Diamond Foundry, ZhengZhou Sino Crystal Diamond, and Henan Huanghe Whirlwind. The first two players will be Heyaru's direct competitors. However, none are located in the Europe nor do they have the production capacity of the planned Belgium facility to create CVD diamonds, placing Heyaru in prime position to capitalize on the imminent boom forecasted for diamonds in the electronics industry.

**Competitive Advantage:** Heyaru and her partners will license intellectual property developed at the research centers and its parent company. That intellectual property will also include reactor designs for the production of uniformly high-quality diamonds with a higher throughput than traditional reactors and a recipe for synthetic diamonds superior to that of our competitors.

**Strategic partnerships:** Heyaru has developed a strategic technical partnership with research centers to develop cutting edge production capabilities. Heyaru also plans to partner with research centers on the development of future diamond-based technologies such as Quantum, optical electronics, among others.

**Customer's value proposition:** Heyaru will offer its customers a consistent supply of specifically designed high-quality Ila created diamonds that will replace legacy components in power electronics, lasers, couplers, etc. with longer-lasting energy-efficient components.

**Go to Market:** In the initial phase we will leverage the current customer base. In later phases, we will expand sales to customers in the U.S. and Europe where there is strong demand for our diamonds. Currently there are only handful of competitors in these segments. As our capacity increases sales and marketing efforts directed at the targeted list of companies identified above will expand.

**5 E's:** Heyaru grown diamonds will be ecological, economical, educational, ethical & will create skilled employment

## P&L Statement

P&L statement (EURO) UNAUDITED	1 <sup>st</sup> Apr 2020	1 <sup>st</sup> Apr 2021	1 <sup>st</sup> Apr 2021	1 <sup>st</sup> Apr 2022	1 <sup>st</sup> Apr 2023	1 <sup>st</sup> Apr 2024	1 <sup>st</sup> Apr 2025	1 <sup>st</sup> Apr 2026	1 <sup>st</sup> Apr 2026
	31 <sup>st</sup> Mar 2021	30 <sup>th</sup> Sept. 2021	31 <sup>st</sup> Mar 2022	31 <sup>st</sup> Mar 2023	31 <sup>st</sup> Mar 2024	31 <sup>st</sup> Mar 2025	31 <sup>st</sup> Mar 2026	31 <sup>st</sup> Mar 2026	31 <sup>st</sup> Mar 2027
Total revenue	<u>966,175</u>	<u>834,118</u>	<u>3,425,335</u>	<u>22,517,236</u>	<u>60,675,159</u>	<u>145,759,011</u>	<u>197,628,261</u>	<u>197,073,951</u>	
Cost of sales	(480,875)	(295,221)	(1,575,553)	(11,935,343)	(35,927,503)	(87,183,324)	(119,439,215)	(120,377,447)	
Gross margin	<u>485,300</u>	<u>538,896</u>	<u>1,849,782</u>	<u>10,581,894</u>	<u>24,747,656</u>	<u>58,575,687</u>	<u>78,189,046</u>	<u>76,696,505</u>	
Operating expenses	(246,928)	(85,674)	(238,990)	(1,062,005)	(2,702,561)	(6,340,658)	(8,412,722)	(8,406,014)	
EBITDA	238,372	453,222	1,610,792	9,519,889	22,045,095	52,235,029	69,776,324	68,290,491	
EBIT	(121)	302,307	910,755	7,270,478	15,647,466	37,196,678	49,663,866	48,364,641	
Interest	(81,298)	(59,832)	(424,636)	(579,205)	(354,240)	(377,607)	(227,706)	(39,675)	
Profit before taxes (PBT)	(81,419)	242,475	486,120	6,691,273	15,293,226	36,819,071	49,436,161	48,324,966	
Taxes	(9,416)	-	-	(627,664)	(2,394,833)	(5,976,150)	(7,692,524)	(7,477,026)	
Profit after taxes (PAT)	(90,836)	242,475	486,120	6,063,609	12,898,392	30,842,921	41,743,636	40,847,939	
Retained earnings	<u>(864,632)</u>	<u>(622,157)</u>	<u>(378,513)</u>	<u>5,685,096</u>	<u>18,583,488</u>	<u>49,426,409</u>	<u>91,170,046</u>	<u>132,017,985</u>	
Key performance indicators									
Revenue Growth (Y-O-Y)	100.6%	73.1%	254.5%	557.4%	169.5%	140.2%	35.6%	-0.3%	
Gross margin on goods sold	47.1%	64.5%	54.0%	47.0%	40.8%	40.2%	39.6%	38.9%	
EBITDA	24.7%	54.3%	47.0%	42.3%	36.3%	35.8%	35.3%	34.7%	
EBIT	0.0%	36.2%	26.6%	32.3%	25.8%	25.5%	25.1%	24.5%	
PBT	-8.4%	29.1%	14.2%	29.7%	25.2%	25.3%	25.0%	24.5%	
PAT	-9.4%	29.1%	14.2%	26.9%	21.3%	21.2%	21.1%	20.7%	

## Balance Sheet

Balance sheet (EURO) UNAUDITED	1 <sup>st</sup> Apr 2020	1 <sup>st</sup> Apr 2021	1 <sup>st</sup> Apr 2021	1 <sup>st</sup> Apr 2022	1 <sup>st</sup> Apr 2023	1 <sup>st</sup> Apr 2024	1 <sup>st</sup> Apr 2025	1 <sup>st</sup> Apr 2026	1 <sup>st</sup> Apr 2026
	- 31 <sup>st</sup> Mar 2021	- 30 <sup>th</sup> Sept. 2021	- 31 <sup>st</sup> Mar 2022	- 31 <sup>st</sup> Mar 2023	- 31 <sup>st</sup> Mar 2024	- 31 <sup>st</sup> Mar 2025	- 31 <sup>st</sup> Mar 2026	- 31 <sup>st</sup> Mar 2026	- 31 <sup>st</sup> Mar 2027
<b>CAPITAL EMPLOYED</b>									
Tangible fixed assets	4,640,548	5,004,271	16,989,051	56,239,003	147,057,981	326,529,931	306,361,804	286,342,775	
Intangible assets	8,637,628	8,637,628	8,637,500	8,637,500	8,637,500	8,637,500	8,637,500	8,637,500	8,637,500
Net working capital	2,472,408	5,111,119	4,336,564	15,375,471	36,920,264	86,303,129	127,182,328	187,389,811	
<b>TOTAL CAPITAL EMPLOYED</b>	<b>15,750,585</b>	<b>18,753,018</b>	<b>29,963,115</b>	<b>80,251,974</b>	<b>192,615,745</b>	<b>421,470,561</b>	<b>442,181,632</b>	<b>482,370,085</b>	
<b>FUNDING</b>									
Share capital in kind	8,637,628	8,637,628	8,637,500	8,637,500	8,637,500	8,637,500	8,637,500	8,637,500	8,637,500
Equity	5,342,317	8,531,809	11,039,816	54,724,372	164,845,086	390,213,496	431,957,132	472,805,072	
<b>TOTAL FUNDING</b>	<b>15,750,585</b>	<b>18,753,018</b>	<b>29,963,115</b>	<b>80,251,974</b>	<b>192,615,745</b>	<b>421,470,561</b>	<b>442,181,632</b>	<b>482,370,085</b>	
<b>Key Ratios</b>									
Leverage Ratio	-	-	-	-	-	-	-	-	-
Solvency Ratio	0.86	0.90	0.66	0.79	0.90	0.95	1.00	1.00	
ROCE	0.03	0.04	0.08	0.13	0.12	0.13	0.16	0.14	
ROE	(0.03)	0.06	0.09	0.13	0.09	0.09	0.12	0.12	
Debt/Equity Ratio	0.42	0.22	1.09	0.36	0.13	0.07	0.00	0.00	
Current Ratio	20,674.63	20,659.78	n/a						
<b>Balance sheet – Assets &amp; Liabilities</b>									
Tangible fixed assets	4,640,548	5,004,271	16,989,051	56,239,003	147,057,981	326,529,931	306,361,804	286,342,775	
Intangible assets	8,637,628	8,637,628	8,637,500	8,637,500	8,637,500	8,637,500	8,637,500	8,637,500	
Current assets	2,893,722	5,351,998	4,336,564	15,375,471	36,920,264	86,303,129	127,182,328	187,389,811	
<b>TOTAL ASSETS</b>	<b>16,171,899</b>	<b>18,993,897</b>	<b>29,963,115</b>	<b>80,251,974</b>	<b>192,615,745</b>	<b>421,470,561</b>	<b>442,181,632</b>	<b>482,370,085</b>	
Shareholders' funds	12,342,826	14,041,301	15,795,285	63,361,872	173,482,586	398,850,996	440,594,632	481,442,572	
Current liabilities	421,314	240,879	-	-	-	-	-	-	
Term loans	1,749,958	1,562,899	8,918,975	6,991,766	5,105,350	3,317,656	1,586,999	927,514	
<b>Total LRM funding</b>	<b>1,637,120</b>	<b>3,128,136</b>	<b>3,882,031</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
WC and cash facility	20,682	20,682	1,366,824	9,898,336	14,027,808	19,301,909	-	-	
<b>Long-term liabilities</b>	<b>3,387,078</b>	<b>4,691,035</b>	<b>12,801,006</b>	<b>6,991,766</b>	<b>5,105,350</b>	<b>3,317,656</b>	<b>1,586,999</b>	<b>927,514</b>	
<b>TOTAL EQUITY + LIABILITIES</b>	<b>16,171,898</b>	<b>18,993,897</b>	<b>29,963,115</b>	<b>80,251,974</b>	<b>192,615,745</b>	<b>421,470,561</b>	<b>442,181,632</b>	<b>482,370,085</b>	



# HEYARU

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*Phase 1A upcoming*

## HEYARU ENGINEERING NV

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