



Nvidia (NVDA.O/NVDA US)

Price as of Feb 22: US207.5

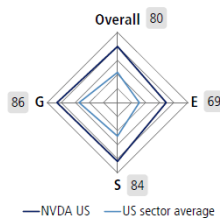
Strengthening gaming & data center demand

Trading data

| | |
|------------------------------|-------------|
| Mkt cap (US\$bn) | 510.5 |
| Outstanding shares (mn) | 2,460 |
| Institutional ownership (%) | 74.6 |
| 3M avg. daily trading (mn) | 45.7 |
| 52-week trading range (US\$) | 108.1-289.5 |

| Performance | 3M | 6M | 12M |
|--------------|------|------|--------|
| Absolute (%) | 29.4 | 21.8 | (11.3) |
| Relative (%) | 29.7 | 25.4 | (4.0) |

ESG score card



Source: Refinitiv, KGI Research

Event

Nvidia (US) has provided strong 1Q FY24F (FY ends January) guidance on strengthening demand across its gaming (30% of 4Q FY23 revenue) and data center (60%) product lines, despite the ongoing inventory issue. Midpoint revenue and net income guidance was a respective 2% and 3% above consensus (Figure 2). Although in-house DOI further rose to 226 days (Figure 14), the channel inventory issue for gaming products is already behind us, while that for PC products will be solved before the end of June. Initial signs of gaming demand recovery in China are encouraging, which will lead to earlier-than-expected gaming revenue sequential growth from 1Q FY24F. The company is even more positive on data center, and expects accelerating YoY revenue growth from 2Q FY24F, which is a quarter earlier than that for Intel (US) and AMD (US). We believe this is largely due to Nvidia's dominant position in the AI industry (GPU, software, ecosystem, and high-speed chip connection), as well as penetration of the new CPU product category.

Impact

In-house inventory issue to improve in 1Q FY24F. 4Q FY23 in-house inventory dollar value did not decline as expected, largely on lower-than-expected data center sales (7% below consensus; Figure 3) due to some CSPs altering their build plans, China disruptions, and soft CPU infrastructure build-out. However, pull-in momentum will likely resume this quarter, together with stronger-than-expected gaming demand thanks to lean channel inventory and robust acceptance of new products.

Promising AI computing. Gartner predicts generative AI will account for 10% of all data produced by 2025, up from less than 1% in 2021. We estimate less than 1% of revenue contribution to Nvidia this year, but we could see another US\$5-6bn in three years. H100 just launched in 3Q FY23 and its revenue has already surpassed that of A100 in 4Q FY23. H100 can greatly reduce training time from five days to 11 hours. For inferencing, the company said that the throughput of H100 is 30 times that of A100.

Key financials and valuations

| | Jan-21A | Jan-22A | Jan-23A | Jan-24F | Jan-25F |
|------------------------------|----------|----------|----------|----------|----------|
| Revenue (US\$mn) | 16,675 | 26,914 | 26,974 | 28,141 | 35,654 |
| Gross profit (US\$mn) | 10,948 | 17,968 | 15,965 | 18,804 | 23,889 |
| Operating profit (US\$mn) | 6,803 | 12,691 | 9,040 | 11,526 | 15,213 |
| EBITDA (US\$mn) | 6,649 | 12,028 | 9,096 | 12,113 | 16,237 |
| Net profit (US\$mn) | 6,277 | 11,259 | 8,365 | 9,854 | 13,549 |
| EPS (US\$) | 2.50 | 4.44 | 3.38 | 3.98 | 5.47 |
| Revenue growth (%) | 52.7 | 61.4 | 0.2 | 4.3 | 26.7 |
| EPS growth (%) | 72.7 | 77.6 | (24.0) | 17.8 | 37.5 |
| Gross margin (%) | 65.7 | 66.8 | 59.2 | 66.8 | 67.0 |
| Operating margin (%) | 40.8 | 47.2 | 33.5 | 41.0 | 42.7 |
| EBITDA margin (%) | 39.9 | 44.7 | 33.7 | 43.0 | 45.5 |
| Net debt to equity (%) | Net Cash | Net Cash | Net Cash | Net Cash | Net Cash |
| Return on average equity (%) | 29.8 | 44.8 | 29.8 | 44.2 | 53.9 |

Source: Company data, KGI Research estimates

Note: Fiscal year ends January

Figure 1: Breakdown of 4Q FY23 results

| (US\$bn) | 4Q FY23 | QoQ (%) | YoY (%) | Guidance | Consensus | Diff. (%) |
|----------------------|---------|----------|------------|----------|-----------|-----------|
| Revenue | 6.1 | 2.0 | (20.8) | 6.0 | 6.0 | 0.5 |
| Gross profit | 4.0 | 20.1 | (22.0) | 4.0 | 4.0 | 0.8 |
| Gross margin (%) | 66.1 | 996bps | (95bps) | 66.0 | 65.9 | 23bps |
| Operating profit | 2.2 | 44.8 | (39.5) | 2.2 | 2.2 | 1.7 |
| Operating margin (%) | 36.8 | 1,086bps | (1,136bps) | 36.3 | 36.3 | 43bps |
| Pre-tax profit | 2.2 | 44.2 | (39.8) | 2.1 | 2.2 | (1.7) |
| Pre-tax margin (%) | 36.0 | 1,055bps | (1,139bps) | 35.7 | 36.8 | (79bps) |
| Income tax | 0.0 | (87.5) | (97.5) | 0.2 | 0.2 | (96.7) |
| Tax rate (%) | 0.3 | (338bps) | (727bps) | 9.0 | 9.6 | (928bps) |
| Net profit | 2.2 | 49.3 | (35.1) | 1.9 | 2.0 | 8.4 |
| Net margin (%) | 35.9 | 1,138bps | (790bps) | 32.5 | 33.3 | 263bps |
| Diluted EPS (US\$) | 0.86 | 50.6 | (33.3) | | 0.81 | 5.4 |

Source: Company data; KGI Research

Figure 2: Breakdown of 1Q FY24F outlook

| | 1Q FY24 | QoQ (%) | YoY (%) | Consensus | Diff. (%) |
|----------------------|---------|----------|----------|-----------|-----------|
| Revenue | 6.5 | 7.4 | (21.6) | 6.4 | 2.0 |
| Gross profit | 4.3 | 8.1 | (22.3) | 4.2 | 3.0 |
| Gross margin (%) | 66.5 | 41bps | (62bps) | 65.9 | 59bps |
| Operating profit | 2.5 | 14.3 | (35.7) | 2.4 | 5.3 |
| Operating margin (%) | 39.1 | 236bps | (860bps) | 37.9 | 122bps |
| Other incomes | (0.1) | (216.3) | 11.1 | 0.0 | (235.3) |
| Pre-tax profit | 2.5 | 14.3 | (36.3) | 2.5 | 1.7 |
| Pre-tax margin (%) | 38.3 | 230bps | (883bps) | 38.5 | (13bps) |
| Income tax | 0.3 | 4,528.9 | 73.3 | 0.3 | (7.1) |
| Tax rate (%) | 13.0 | 1,268bps | 822bps | 14.2 | (124bps) |
| Net profit | 2.2 | (0.3) | (37.0) | 2.1 | 3.2 |
| Net margin (%) | 33.4 | (257bps) | (818bps) | 33.0 | 37bps |

Source: Company data; KGI Research

Figure 3: Revenue by end market

| (US\$mn) | 3Q FY22 | 4Q FY22 | 1Q FY23 | 2Q FY23 | 3Q FY23 | 4Q FY23 |
|----------------------------|---------|---------|---------|---------|---------|---------|
| Gaming | 3,221 | 3,420 | 3,620 | 2,042 | 1,574 | 1,831 |
| Data center | 2,936 | 3,263 | 3,750 | 3,806 | 3,833 | 3,616 |
| Professional visualization | 577 | 643 | 622 | 496 | 200 | 226 |
| Automotive | 135 | 125 | 138 | 220 | 251 | 294 |
| PC OEM/ IP | 234 | 192 | 158 | 140 | 73 | 84 |
| Weighting (%) | | | | | | |
| Gaming | 45 | 45 | 44 | 30 | 27 | 30 |
| Data center | 41 | 43 | 45 | 57 | 65 | 60 |
| Professional visualization | 8 | 8 | 8 | 7 | 3 | 4 |
| Automotive | 2 | 2 | 2 | 3 | 4 | 5 |
| PC OEM/ IP | 3 | 3 | 2 | 2 | 1 | 1 |
| YoY (%) | | | | | | |
| Gaming | 42 | 37 | 31 | (33) | (51) | (46) |
| Data center | 55 | 71 | 83 | 61 | 31 | 11 |
| Professional visualization | 144 | 109 | 67 | (4) | (65) | (65) |
| Automotive | 8 | (14) | (10) | 45 | 86 | 135 |
| PC OEM/ IP | 21 | 25 | (52) | (66) | (69) | (56) |

Source: Company data; KGI Research

Figure 4: Revenue trend by end market (4Q FY23)

| | |
|----------------------------|---|
| Gaming | The YoY decline reflects the impact of channel inventory correction, which is largely behind us. And demand in the seasonally strong fourth quarter was solid in most regions. |
| Data center | Hyperscale customer revenue posted strong sequential growth, though short of Nvidia's expectations as some cloud service providers paused at the end of the year to recalibrate their build plans. The company believes this is a timing issue as the end market demand for GPUs and AI infrastructure is strong. |
| Professional visualization | YoY decline reflects the impact of the channel inventory correction, which Nvidia expects to end in 1H23. |
| Automotive | Sequential growth was driven primarily by AI automotive solutions. New program ramps at both electric vehicle and traditional OEM customers helped drive this growth. |
| PC OEM/ IP | The year-on-year decreases for the quarter and fiscal year were driven by notebook OEM and Cryptocurrency Mining Processor (CMP). |

Source: Company data; KGI Research

Figure 5: Roadmap

| | 1Q22 | 2Q22 | 3Q22 | 4Q22 | 1Q23F | 2Q23F | 3Q23F | 4Q23F | 1Q24F | 2Q24F | 3Q24F | 4Q24F | 1H25F | 2H25F |
|------------|---------------|---|--|--|-------|----------------------------------|---|-----------------------------------|---|-------|------------------------------------|------------|--------------|-------|
| CPU | Intel | | | | | | | | | | | | | |
| | NB | Intel 7 Alder Lake | | Intel 7 Raptor Lake | | | | Intel 4 Meteor Lake (Intel 4) | | | NX (TSMC) and Intel 18A Lunar Lake | | Panther Lake | |
| | Desktop | Intel 7 Alder Lake | | Intel 7 Raptor Lake | | | | Intel 4 Meteor Lake (Intel 4) | | | N3 (TSMC) and Intel 20A Arrow Lake | | Panther Lake | |
| | Server | 10nm+ Ice Lake-SP | | Intel 7 Sapphire Rapids (re-tape out) Intel 7 Sapphire Rapids HBM in 4Q22 | | Intel 7 Emerald Rapids | | | Intel 3 Granite Rapids (P-core) Intel 3 Sierra Forest (E-core) | | | | | |
| | AMD | | | | | | | | | | | | | |
| | NB | N6 (TSMC) Rembrandt (Zen 3+) | | N4 (TSMC) Phoenix (Zen 4), N5 (TSMC) Dragon Range (Zen 4) | | | | N4/3 (TSMC) Strix Point (Zen 5) | | | | | | |
| | Desktop | N7 (TSMC) Vermeer (Zen 3) | | N5 (TSMC) Raphael (Zen 4) | | | | N4/3 (TSMC) Granite Ridge (Zen 5) | | | | | | |
| | Server | N7+ (TSMC) Milan (Zen 3) | | N5 (TSMC) Genoa (Zen 4) N5 (TSMC) Bergamo (Zen 4C) in 1H23 | | | | N4/3 (TSMC) Turin (Zen 5) | | | | | | |
| | Nvidia | | | | | | | | | | | | | |
| | Server | | | | | 5nm (TSMC) Grace | | | | | | Grace Next | | |
| GPU | Intel | | | | | | | | | | | | | |
| | PC | N6 (TSMC) Arc Alchemist N8 in 1Q22; DT/Workstation in 4Q22 | | | | | | Battlemage | | | Celestial | | | |
| | Server | Intel 10nm SF Xe-LP | N5/6/7 (TSMC) & Intel 7 Ponte Vecchio Intel 10 Arctic Sound-M in 3Q22 | | | | Rialto Bridge; Intel 20A Falcon Shores (XPU) Next Arctic Sound in 4Q23 | | | | | | | |
| | AMD | | | | | | | | | | | | | |
| | PC | N7+ (TSMC) Big Navi (RDNA2) | | N5 (TSMC) Navi 3x RDNA3 | | | | N4/3 (TSMC) Navi 4x RDNA4 | | | | | | |
| | Server | N6 (TSMC) Aldebaran (CDNA2) | | | | N5 (TSMC) Instinct MI300 (CDNA3) | | | | | | | | |
| | Nvidia | | | | | | | | | | | | | |
| | PC | 8nm (SEC) Ampere | | N4 (TSMC) Ada Lovelace | | | | Blackwell (?) | | | | | | |
| | Server | N7 (TSMC) Ampere (A100) | | N4 (TSMC) Hopper | | | | Blackwell (?) | | | | | | |

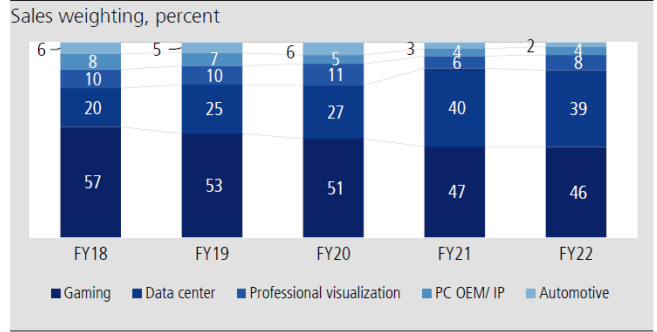
Source: Company data; KGI Research

Figure 7: Company profile

Founded in 1993, Nvidia is a global fabless semiconductor company that designs and sells integrated circuit (IC) products (CPUs, GPUs, and DPUs), mainly used in the PC, server, and automotive industries. The company holds a leading position in the discrete desktop GPU market with a near 80% market share in 2020. Nvidia is transitioning into a data-centric company, targeting long-term earnings growth in AI and HPC computing.

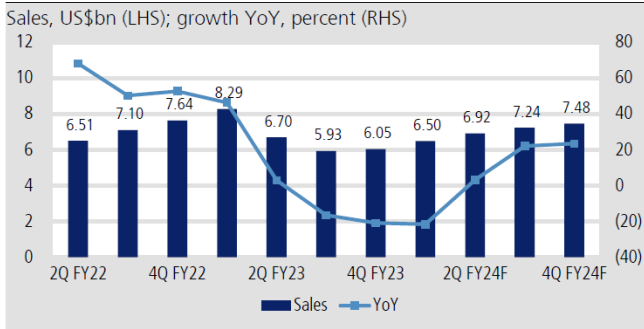
Source: Company data; KGI Research

Figure 8: Revenue by end market



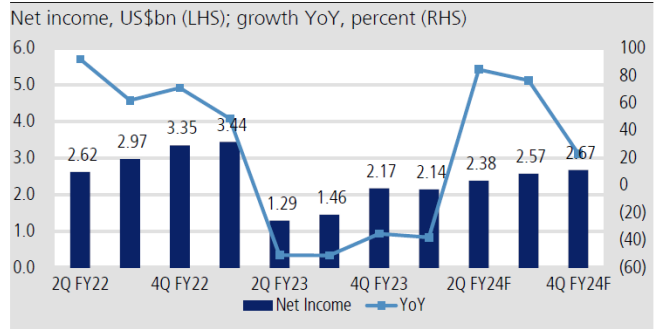
Source: Company data; KGI Research

Figure 9: Sales & YoY



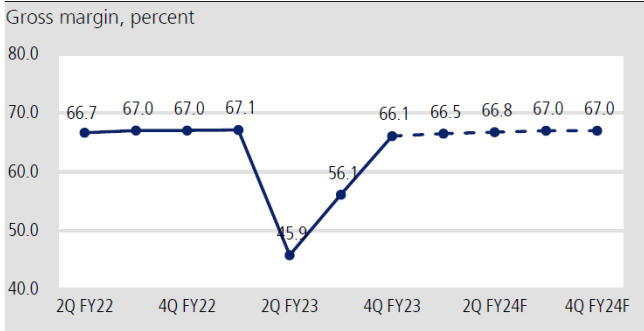
Source: Company data; KGI Research

Figure 10: Net income & YoY



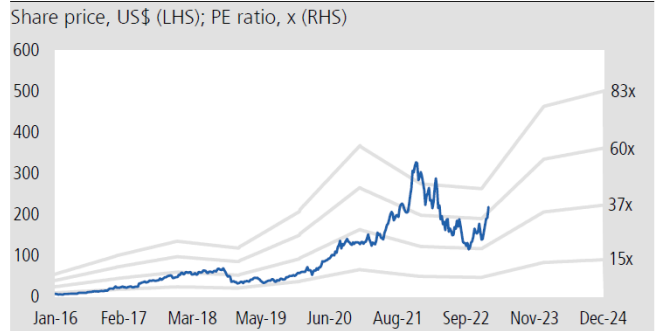
Source: Company data; KGI Research

Figure 11: Gross Margin



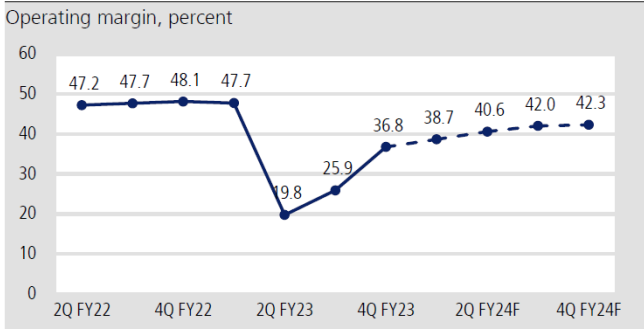
Source: Company data; KGI Research

Figure 12: 12M forward PE band



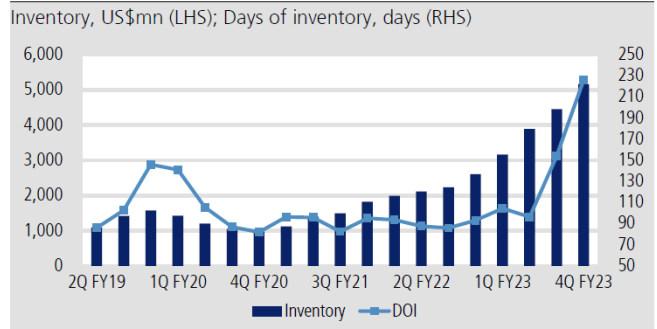
Source: Bloomberg; KGI Research

Figure 13: Operating Margin



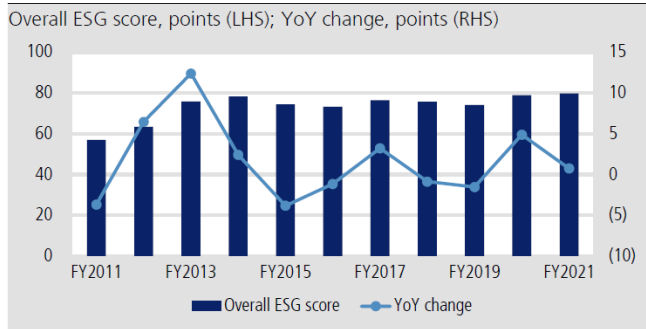
Source: Company data; KGI Research

Figure 14: Inventory & DOI



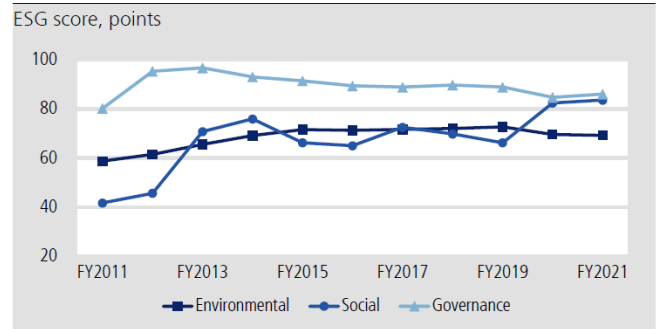
Source: Company data; KGI Research

Figure 15: Nvidia – Overall ESG score



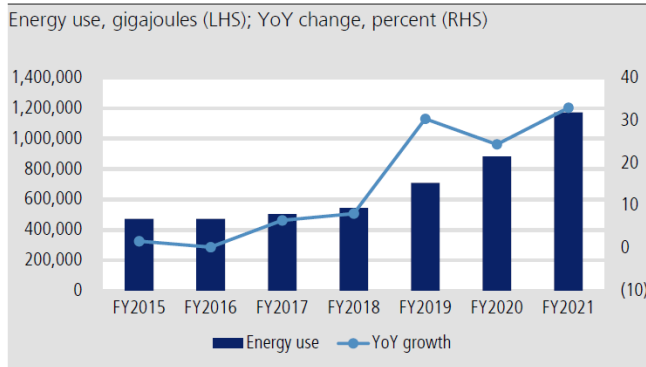
Source: Refinitiv; Company data

Figure 16: Nvidia – ESG score by category



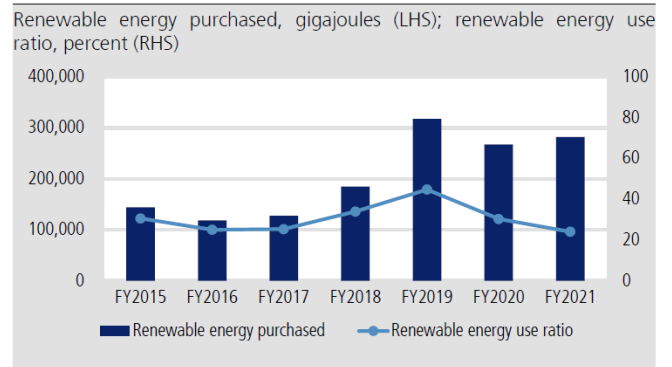
Source: Refinitiv; Company data

Figure 17: Nvidia – Energy use



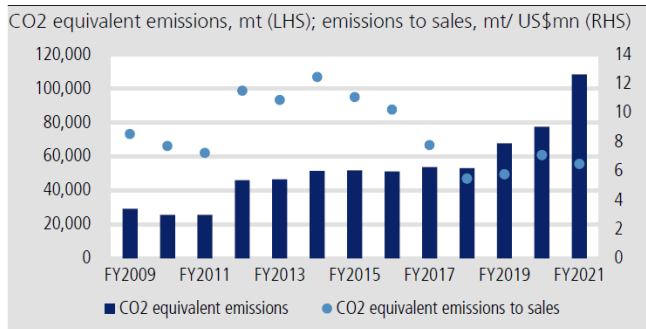
Source: Refinitiv; Company data

Figure 18: Nvidia – Renewable energy



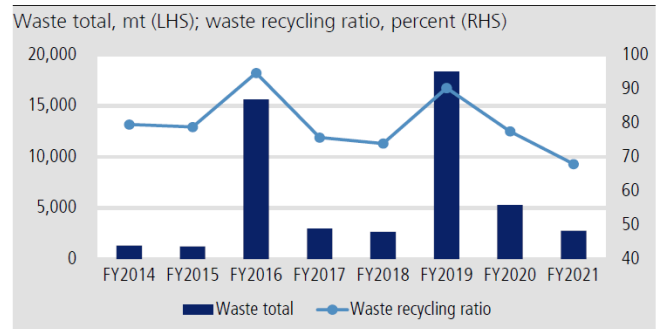
Source: Refinitiv; Company data

Figure 19: Nvidia – CO2 equivalent emissions



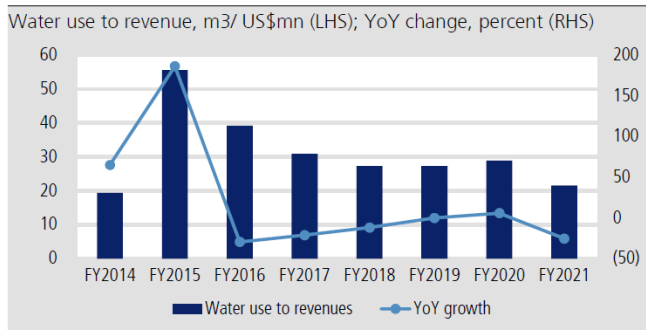
Source: Refinitiv; Company data

Figure 20: Nvidia – Waste total



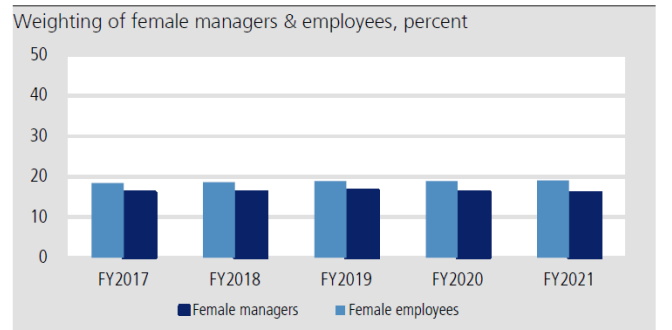
Source: Refinitiv; Company data

Figure 21: Nvidia – Water use to revenue



Source: Refinitiv; Company data

Figure 22: Nvidia – Gender diversification



Source: Refinitiv; Company data

| Item | Definition |
|-----------------------------------|---|
| Energy use | Total direct and indirect energy consumption in gigajoules. - the total amount of energy that has been consumed within the boundaries of the company's operations - total energy use = total direct energy consumption + indirect energy consumption - purchased energy and produced energy are included in total energy use - for utilities, transmission/ grid loss as part of its business activities is considered as total energy consumed and data does not consider electricity produced to answer energy use (utility company produces to sell) - for utilities, raw materials such as coal, gas or nuclear used in the production of energy are not considered under 'total energy use' |
| Renewable energy purchased | Total primary renewable energy purchased in gigajoules. - energy consumed by the company from various sources and among the purchased energy, how much energy is renewable in nature (solar, wind, hydro, biomass, geothermal) are in scope - if there is no evidence that renewable energy is produced by the company, then we consider the reported energy figure as renewable energy purchased |
| Renewable energy use ratio | Renewable energy to total energy used |
| CO2 equivalent emissions | Direct CO2 and CO2 equivalent emissions in metric tons. - direct emissions from sources that are owned or controlled by the company (scope 1 emissions) - following gases are relevant: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorinated compound (PFCS), sulfur hexafluoride (SF6), nitrogen trifluoride (NF3) |
| CO2 equivalent emissions to sales | Direct CO2 and CO2 equivalent emissions (metric tons) to sales (NT\$m) - direct emissions from sources that are owned or controlled by the company (scope 1 emissions) - following gases are relevant: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorinated compound (PFCS), sulfur hexafluoride (SF6), nitrogen trifluoride (NF3) |
| Waste total | Total amount of waste produced in metric tons. - total waste = non-hazardous waste + hazardous waste - only solid waste is taken into consideration, exceptionally if liquid waste is reported in metric tons, then we do the summation to derive total including liquid waste - for sectors like mining, oil & gas, waste generation like tailings, waste rock, coal and fly ash are also considered |
| Waste recycling ratio | The waste recycling ratio as reported by the company. - waste recycling ratio = waste recycled/total waste*100 - waste to energy or waste incinerated with energy recovery are considered as waste recycled - waste recovered via composting is considered as recycled waste |
| Water withdrawal total | Total water withdrawal in cubic meters. - the total volume of water withdrawn from any water source that was either withdrawn directly by the reporting organization or through intermediaries such as water utilities - different sources of water like wells, town/utility/municipal water, river water, and surface water are considered |
| Environmental expenditures | Total amount of environmental expenditures. - all environmental investment & expenditures for environmental protection or to prevent, reduce, control environmental aspects, impacts, and hazards. It also includes disposal, treatment, sanitation, and clean-up expenditures |
| Turnover of employees | Percentage of employee turnover. - includes employees who left the company for any reason (voluntary or involuntary), such as resignations, retirement, natural departure/death, medical incapacitation, redundancy, layoffs, restructuring, dismissal, retrenchment or end of a fixed-term contract - employees turnover rate = (employees leaving/average number of employees)*100 - where the average number of employees = (employees at the end of the current year + employees at the end of the previous year)/2 - employees at the end of the current fiscal year = employees at the end of the previous fiscal year + new employees - employees leaving |
| Women managers | Percentage of women managers. - percentage of women managers among total managers of the company - if there is a breakdown by category in percentage, such as top, senior, middle, and junior management, then we consider the percentage of middle women managers - percentage of women managers = number of women managers/total number of managers*100 |
| Women employees | Percentage of women employees. - percentage of women employees to the total number of employees of the company - percentage of women employees = number of women/total number of employees*100 |
| Training hours total | Total training hours performed by all employees. - consider only employee training hours - includes all types of training given to general employees (such as health & safety, environmental, emergency response, skills & career development training) - if the value is given in days, multiply by 8, assuming that 1 day = 8 hours worked |
| Training hours per employee | Training hours per employee per year |
| Shareholders score | Shareholders category score measures a company's effectiveness towards equal treatment of shareholders and the use of anti-takeover devices. |
| Management score | Management category score measures a company's commitment and effectiveness towards following best practice corporate governance principles. |
| Product responsibility score | Product responsibility category score reflects a company's capacity to produce quality goods and services integrating the customer's health and safety, integrity and data privacy. |
| Community score | Community category score measures the company's commitment towards being a good citizen, protecting public health and respecting business ethics. |
| Workforce score | Workforce category score measures a company's effectiveness towards job satisfaction, healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce. |
| Resource use score | Resource use category score reflects a company's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management. |

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