Western Digital
Investor Relations

April 2022
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FLASH VENTURES

One of the most successful partnerships in technology

- Deep, longstanding 22-year partnership consisting of three jointly owned entities
- Jointly develop and produce high performance, low-cost NAND flash
- Successfully introduced 15 generations of leading-edge technology nodes
- Leverage economies of scale through combined financial resources and joint R&D efforts
How the Flash Ventures Work

**Business Summary**
Develop, manufacture, and sell flash wafers to the joint venture partners — Western Digital and Kioxia

**Organization & Governance**
Each of the three Flash Ventures' entities have two shareholders (Western Digital and Kioxia) and a Board of Directors

**R&D Collaboration**
Develop leading-edge flash technology and manufacturing processes for the benefit of Western Digital and Kioxia

**Enduring Partnership**
Strong 22-year partnership with long-term commitments in place for at least 12 more years

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# How the Flash Ventures Work

## Organizational Structure and Governance

| Western Digital and Kioxia each appoint an **equal number of members** to Flash Ventures' Boards of Directors and Operating Committees. | **Unanimous approval** of Flash Ventures' Board of Directors is required for manufacturing capacity increases, technology transitions and funding mechanisms. | **Operating Committee** for each fab:  
- Oversees day-to-day fab operations  
- Determines fab staffing levels  
- Manages technology transitions |

## Operations and Separate Go-to-Market Strategies

| Western Digital and Kioxia **co-develop flash** (including process technology and memory design) and contribute IP for Flash Ventures' use. | **Kioxia builds and owns cleanrooms** and provides wafer manufacturing services to Flash Ventures. Flash Ventures owns and leases equipment. | Western Digital and Kioxia use the output in their **separate products and go-to-market activities**. |

## Funding

| Western Digital and Kioxia fund **Flash Ventures equipment purchases ~50/50**. To the extent funding is provided in the form of loans from Western Digital and Kioxia, Flash Ventures repays such loans using excess operating cash flow. | **Flash Ventures pays Kioxia's costs to manufacture wafers** and for the Western Digital engineers who work in the fabs with the Kioxia engineers. | Western Digital and Kioxia share the cost of **joint R&D 50/50**. |
Overview of Flash Ventures

Flash Partners, Ltd. (2004 – 2029)

Flash Alliance, Ltd. (2006 – 2029)

Flash Forward, Ltd. (2010 – 2034)

Three Flash Ventures’ entities utilize cleanroom space in seven fabs across two manufacturing sites.

Yokkaichi mega fab complex is the world’s largest NAND manufacturing site.

Flash Ventures accounts for >80% of wafers produced at the Yokkaichi and Kitakami fabs.

Flash Ventures’ wafer output is split ~50/50 between Western Digital and Kioxia.

Western Digital and Kioxia together are the world’s largest producer of NAND flash.
Yokkaichi mega fab complex is the world’s largest NAND manufacturing site.
Flash Ventures accounts for >80% of wafers produced at the Yokkaichi and Kitakami fabs
  • Flash Ventures’ wafer output is split ~50/50 between Western Digital and Kioxia
  • The remainder of the wafer output is solely Kioxia’s
### Joint Venture Operational Framework

<table>
<thead>
<tr>
<th>Western Digital.</th>
<th>KIOXIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Co-develops flash</strong> (including process technology and memory design) with Kioxia and contributes IP for Flash Ventures’ use</td>
<td><strong>Co-develops flash</strong> (including process technology and memory design) with Western Digital and contributes IP for Flash Ventures’ use</td>
</tr>
<tr>
<td><strong>Performs integral manufacturing and R&amp;D functions at Flash Ventures’ manufacturing sites</strong></td>
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</tr>
<tr>
<td><strong>Purchases Flash Ventures’ wafers at Kioxia’s manufacturing cost plus a small markup</strong></td>
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</tbody>
</table>
| **Funds Flash Ventures’ equipment purchases and leases**  
• Equipment depreciation and lease expense payments  
• Equipment lease guarantees  
• Loan advances  
• Equity injections | **Funds Flash Ventures’ equipment purchases and leases**  
• Equipment depreciation and lease expense payments  
• Equipment lease guarantees  
• Loan advances  
• Equity injections |
| **Flash Ventures**  
49.9% Owned by Western Digital  
50.1% Owned by Kioxia | **Flash Ventures**  
Owned and leases equipment for flash wafer production and R&D line |
| **Pays vendors for tool purchases** using net operating cash flow, sale-and-leaseback proceeds and loans from WD and KIC  
• **Charges expenses to Western Digital and Kioxia** (incl. equipment depreciation and lease expense) and remits lease payments to lessees  
• **Sale-and-leaseback transactions** with third party financial institutions  
• **Borrows from Western Digital and Kioxia** for a portion of their equipment purchases  
• **Repays parent loans** using excess sale-and-leaseback proceeds and net operating cash flow | **Owns and operates cleanrooms** |
| **Provides wafer manufacturing services to Flash Ventures at Kioxia’s manufacturing cost** | **Provides wafer manufacturing services to Flash Ventures at Kioxia’s manufacturing cost** |
Joint Venture Partners
Collaboration and Differentiation

Western Digital.

**Different End Product and Go-to-Market Strategies**
- Assembly and Test
- Controller/System Development
- Marketing/Branding
- Sales/Distribution

Joint Venture/Collaboration
- NAND Flash Development and Design
- NAND Flash Wafer Production

KIOXIA

**Different End Product and Go-to-Market Strategies**
- Assembly and Test
- Controller/System Development
- Marketing/Branding
- Sales/Distribution
STRATEGIC BENEFITS AND FINANCIAL SUPPORT
STRATEGIC BENEFITS OF PARTNERSHIP

SCALE
Financial resources
Equipment purchasing
Fixed cost absorption
Faster technology conversions
Efficiency of tools and labor

INNOVATION
Combines the companies that invented NAND flash and multi bits per cell IP
IP and design collaboration leverage
Memory Development Center integrated within Yokkaichi mega fab complex enabling quicker ramp to production
Combined global talent pool

Worldwide NAND Bit Shipment

Western Digital and Kioxia produce >32% of the world’s bits

Source: Yole Development for CQ4’21

Western Digital has invested ~$19 billion in equipment for Flash Ventures through calendar year 2021
How Does Western Digital Fund Flash Ventures?

Western Digital and Kioxia are each responsible for ~50% of the funding required for Flash Ventures' equipment purchases.

Kioxia is responsible for construction, maintenance and operation of the fabs.

Western Digital funds its portion of Flash Ventures' equipment purchases by:

<table>
<thead>
<tr>
<th>Flash Ventures Parent Loans</th>
<th>Western Digital loans cash to Flash Ventures for a portion of their equipment purchases.</th>
<th>The loans are reflected in Western Digital's cash flow statement and balance sheet.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Ventures Lease Financing</td>
<td>Flash Ventures enters into equipment sale-and-leaseback transactions with a consortium of financial institutions.</td>
<td>Western Digital guarantees 50% of the lease payment obligations. The net guarantee obligation amount is quantified in the notes of its financial statements.</td>
</tr>
<tr>
<td></td>
<td>Flash Ventures charges Western Digital for its share of the lease payments, which are recorded on Western Digital's financial statements as cost of revenue.</td>
<td></td>
</tr>
<tr>
<td>Flash Ventures Net Operating Cash Flow</td>
<td>Western Digital reimburses Flash Ventures for its share of Flash Ventures' expenses, including equipment depreciation, and pays a small markup on wafer purchases. These amounts are included in Western Digital's cost of revenue.</td>
<td>As cash accumulates in Flash Ventures, these funds are used to purchase additional equipment and/or prepay outstanding loans from Western Digital.</td>
</tr>
<tr>
<td></td>
<td>Flash Ventures' net operating cash flow (primarily from reimbursement of depreciation costs through wafer sales) is not disclosed.</td>
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## Summarized Impact of Flash Ventures on Western Digital’s Financial Statements

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
<th>Statement of Operations</th>
<th>Statement of Cash Flows</th>
<th>Balance Sheet</th>
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</thead>
<tbody>
<tr>
<td><strong>Wafer purchases</strong></td>
<td>Charged at cost plus a small markup; manufacturing costs includes materials, labor, equipment depreciation and lease expenses, overhead, etc.</td>
<td>Cost of Revenue</td>
<td>Changes in inventories</td>
<td>Inventory</td>
</tr>
<tr>
<td><strong>Equipment depreciation and lease expenses</strong></td>
<td>Component of manufacturing costs included in the cost of wafer purchases noted above</td>
<td>Cost of Revenue</td>
<td>Changes in accounts payable to related parties</td>
<td>Accounts payable to related parties</td>
</tr>
<tr>
<td><strong>Equipment purchases</strong></td>
<td>Capital equipment and tooling necessary for manufacturing and research; Western Digital may fund purchases via Flash Ventures’ parent loans, lease guarantees, and equity investments (see slide 12 for additional funding sources)</td>
<td></td>
<td>Notes receivable issuances to Flash Ventures</td>
<td>Notes receivable and investments in Flash Ventures</td>
</tr>
<tr>
<td><strong>Building depreciation prepayments</strong></td>
<td>Cash prepayment recorded as a prepaid expense until it is credited against future wafer purchases noted above</td>
<td></td>
<td>Changes in other assets</td>
<td>Other assets</td>
</tr>
<tr>
<td><strong>Research and development</strong></td>
<td>Co-develops flash (including process technology and memory design) and contributes IP for Flash Ventures’ use</td>
<td>Research and development expense</td>
<td></td>
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</tr>
<tr>
<td><strong>Lease guarantee</strong></td>
<td>Off-balance sheet liability disclosed in notes to financial statements</td>
<td></td>
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</table>
Western Digital’s Total Capital Spending

Cash Capital Expenditures\(^{(A)}\)

1. HDD CapEx
2. Flash Non-Fab CapEx
3. Flash Ventures Parent Loans\(^{(B)}\)

Flash Ventures Capital Expenditures

4. Flash Ventures Lease Financing\(^{(B)}\)
5. Flash Ventures Net Operating Cash Flow\(^{(B),(C)}\)

Gross Capital Expenditures

1. HDD CapEx
2. Flash Non-Fab CapEx
3. Flash Ventures Parent Loans\(^{(B)}\)

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A. Cash Capital Expenditures includes purchases of property, plant and equipment, net, and notes receivable issuances to Flash Ventures, net.
B. Flash Ventures Parent Loans, Flash Ventures Lease Financing, and Flash Ventures Net Operating Cash Flow are comprised only of Western Digital’s portions.
C. Flash Ventures Net Operating Cash Flow is primarily generated from equipment depreciation payments.
History of Flash Ventures Milestones

1987  Toshiba Corp. invents NAND flash memory
1988  SanDisk Corp. files first multi-level-cell (MLC) technology patent
1997  SanDisk and Toshiba enter into Patent Cross License Agreement
2000  Form first joint venture in Virginia – FlashVision, LLC
2002  Form FlashVision, Ltd.; jointly invest in Fabs 1 and 2 in Yokkaichi
2004  Form Flash Partners, Ltd.; jointly invest in Fab 3 in Yokkaichi
2006  Form Flash Alliance, Ltd.; jointly invest in Fab 4 in Yokkaichi
2008  Start developing 3D ReRAM together and wind down FlashVision, Ltd.
2009  Toshiba buys out ~20% of Flash Ventures’ capacity
2010  Form Flash Forward, Ltd.; jointly invest in Fab 5 in Yokkaichi
2011  Start developing 3D flash together
2015  Extend Flash Partners, Ltd. until 2029; jointly invest in new Fab 2 in Yokkaichi
2016  Western Digital acquires SanDisk
2017  Toshiba spins out memory business; jointly invest in Fab 6 in Yokkaichi; extend Flash Alliance, Ltd. until 2029 and Flash Forward, Ltd. until 2027
2019  Jointly invest in Fab 1 in Kitakami; extend Flash Forward, Ltd. until 2034 for the Kitakami site
2022  Jointly invest in first phase of Fab Y7 in Yokkaichi