Yole’s methodology for developing market forecasts is different from other market research companies' methodologies:

- Our approach is to build a coherent model where the five-year historical data from product shipments, module sales, and sensor production, along with player market shares, is collectively linked with detailed assumptions.
- Forecasts are made by carefully carrying forward the five-year growth rate with an analyst's appreciation of the dynamics of each application market in mind.

We collect data from several sources, including:

- Primary information from direct contacts and surveys with equipment and materials suppliers.
- Primary information from cost analyses and teardown reports conducted by System Plus Consulting.
- Secondary information from quarterly and annual reports and publications of key players.
- Comparisons between publicly available secondary data from WSTS, OICA, IFR etc.

As a result, we can present synthetic market metrics intrinsic to a specific industry:

- Our approach’s main advantage is the delivery of homogeneous data, ranging from unit shipments and system sales to players’ market shares.
- We update the market information presented in this monitor quarterly.
TABLE OF CONTENTS

CIS MARKET OVERVIEW
• Key comments for Q4 2021
• CIS market dynamics
• Revenue
• Shipments
• Pricing
• Quarterly revenue: Near term
• Quarterly revenue: Long term
• CIS market share

CIS MARKET DEMAND FOR END SYSTEM
• CIS market demand overview
• CIS market segment share
• Mobile market demand
• Consumer market demand
• Computing market demand
• Automotive market demand
• Medical market demand
• Security market demand
• Industry market demand
• Aerospace & Defense market demand

CIS TECHNOLOGY
• CIS wafer production per segment
• Per technology (CIS, LOGIC, MEMORY)
• Shipments by CIS technology node (XX nm)
• Shipments by technology (FSI, BSI, Stack BSI, Multi-Stack)

CIS SUPPLY
• 3D sensing camera revenue per player
• Industry wafer production (CIS wafer production, per foundry - Long/near term - VIS and NIR)
• Industry wafer capacity estimation

CIS PLAYERS
• Sony – Revenue per quarter and per application
• Samsung – Market mix
• OVT – Market mix
• ON Semiconductor – Market mix
• STMicroelectronics – Market mix
• SK Hynix – Market mix
• SmartSens – Market mix
• Panasonic – Market mix
• GalaxyCore – Market mix
• Canon – Market mix
• Others – Market mix
ABOUT THE AUTHORS

Biographies & contacts

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Pierre Cambou MSc, MBA, is a Principal analyst in the Photonic and Sensor Division at Yole Développement (Yole). Pierre's mission is dedicated to imaging related activities by providing market & technology analyses along with strategy consulting services to semiconductor companies. He is responsible for the CIS Quarterly Market Monitor while he has authored more than 15 Yole Market & Technology reports. Pierre has an Engineering degree from Université de Technologie de Compiègne (France) and a Master of Science from Virginia Tech. (VA, USA), Pierre also graduated with an MBA from Grenoble Ecole de Management (France).

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**Chenmeijing Liang**

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Quarterly Market Monitor Sample – CMOS Image Sensor Service
### CIS SHORT-TERM DYNAMICS (RELATIVE TO PRIOR FORECAST)

#### Revenue

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Actual Revenue</th>
<th>Previous Revenue</th>
<th>Q2Q</th>
<th>2022 ASP Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4-20</td>
<td>$6.43</td>
<td>$6.43</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Q1-21</td>
<td>$4.90</td>
<td>$4.90</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Q2-21</td>
<td>$4.43</td>
<td>$4.43</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Q3-21</td>
<td>$5.18</td>
<td>$6.38</td>
<td>-11%</td>
<td></td>
</tr>
<tr>
<td>Q4-21</td>
<td>$6.03</td>
<td>$6.03</td>
<td>7%</td>
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</tr>
<tr>
<td>Q1-22</td>
<td>$5.54</td>
<td>$5.54</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Q2-22</td>
<td>$5.36</td>
<td>$5.67</td>
<td>-6%</td>
<td></td>
</tr>
<tr>
<td>Q3-22</td>
<td>$5.85</td>
<td>$6.95</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Q4-22</td>
<td>$6.46</td>
<td>$6.41</td>
<td>12%</td>
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#### Shipments

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Shipment</th>
<th>Previous Shipment</th>
<th>Q2Q</th>
<th>Demand</th>
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</thead>
<tbody>
<tr>
<td>Q4-20</td>
<td>2.28</td>
<td>1.93</td>
<td>27%</td>
<td>Mobile &amp; Consumer</td>
</tr>
<tr>
<td>Q1-21</td>
<td>1.72</td>
<td>2.28</td>
<td>18%</td>
<td>Automotive</td>
</tr>
<tr>
<td>Q2-21</td>
<td>1.49</td>
<td>1.72</td>
<td>11%</td>
<td>Other</td>
</tr>
<tr>
<td>Q3-21</td>
<td>1.78</td>
<td>1.49</td>
<td>-8%</td>
<td></td>
</tr>
<tr>
<td>Q4-21</td>
<td>2.10</td>
<td>2.14</td>
<td>13%</td>
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<tr>
<td>Q1-22</td>
<td>1.94</td>
<td>2.10</td>
<td>13%</td>
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<td>Q2-22</td>
<td>1.68</td>
<td>1.94</td>
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<tr>
<td>Q3-22</td>
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<td>2.41</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Q4-22</td>
<td>2.36</td>
<td>2.01</td>
<td>13%</td>
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</tbody>
</table>

#### Pricing

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Pricing</th>
<th>Previous Pricing</th>
<th>Q2Q</th>
<th>2022 ASP Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4-20</td>
<td>$2.81</td>
<td>$2.81</td>
<td>-12%</td>
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</tr>
<tr>
<td>Q1-21</td>
<td>$2.85</td>
<td>$2.85</td>
<td>-9%</td>
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</tr>
<tr>
<td>Q2-21</td>
<td>$2.97</td>
<td>$2.98</td>
<td>1%</td>
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<tr>
<td>Q3-21</td>
<td>$2.90</td>
<td>$2.87</td>
<td>-3%</td>
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<tr>
<td>Q4-21</td>
<td>$2.87</td>
<td>$2.86</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Q1-22</td>
<td>$2.86</td>
<td>$3.38</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Q2-22</td>
<td>$3.19</td>
<td>$2.88</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Q3-22</td>
<td>$2.91</td>
<td>$2.71</td>
<td>-5%</td>
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</tr>
<tr>
<td>Q4-22</td>
<td>$2.74</td>
<td>$2.74</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 2022 Revenue Outlook

- Actual Revenue: $23.21B
- Previous Revenue: $24.57B

#### 2022 shipment growth

- Mobile & Consumer: 13%
- Automotive: 13%
- Other: 13%
CIS LONG-TERM DYNAMICS (RELATIVE TO PRIOR FORECAST)

**Revenue**

- **2021 Revenue Outlook**
  - Actual Revenue: $20.54 B
  - Previous Revenue: $21.75 B

- **2021 ASP Outlook**
  - Actual ASP: $X.X $ (2021)
  - Previous ASP: $X.X $ (2021)

- **Revenue YoY**
  - 2019: 25%
  - 2020: 7%
  - 2021e: -1%
  - 2022e: 13%
  - 2023e: 8%
  - 2024e: 7%
  - 2025e: 5%
  - 2026e: 6%

- **Pricing YoY**
  - 2019: 7.8%
  - 2020: 0.9%
  - 2021e: -2.2%
  - 2022e: 0.36%
  - 2023e: 0.8%
  - 2024e: 0.2%
  - 2025e: -1%
  - 2026e: 0%

**Shipments**

- **2021 Shipment Outlook**
  - Actual Shipments: $XXB
  - Previous Shipments: $XXB

- **Shipments YoY**
  - 2019: 16%
  - 2020: 6%
  - 2021e: 1%
  - 2022e: 13%
  - 2023e: 7%
  - 2024e: 7%
  - 2025e: 6%
  - 2026e: 6%

**Demand**

- **Segment demand**
  - Mobile & Consumer
  - Automotive
  - Other

**CIS LONG-TERM DYNAMICS**

- **Revenue**
  - Revenue ($ billions)
  - Previous Revenue
  - YoY
  - 2019: 25%
  - 2020: 7%
  - 2021e: -1%
  - 2022e: 13%
  - 2023e: 8%
  - 2024e: 7%
  - 2025e: 5%
  - 2026e: 6%

- **Pricing**
  - YoY
  - 2019: 7.8%
  - 2020: 0.9%
  - 2021e: -2.2%
  - 2022e: 0.36%
  - 2023e: 0.8%
  - 2024e: 0.2%
  - 2025e: -1%
  - 2026e: 0%

- **Shipments**
  - Shipments (billion units)
  - YoY
  - 2019: 16%
  - 2020: 6%
  - 2021e: 1%
  - 2022e: 13%
  - 2023e: 7%
  - 2024e: 7%
  - 2025e: 6%
  - 2026e: 6%

**CIS LONG-TERM DYNAMICS (RELATIVE TO PRIOR FORECAST)**

- **Revenue**
  - Revenue ($ billions)
  - YoY
  - 2019: 25%
  - 2020: 7%
  - 2021e: -1%
  - 2022e: 13%
  - 2023e: 8%
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- **Pricing**
  - YoY
  - 2019: 7.8%
  - 2020: 0.9%
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  - 2023e: 0.8%
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  - Shipments (billion units)
  - YoY
  - 2019: 16%
  - 2020: 6%
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  - 2022e: 13%
  - 2023e: 7%
  - 2024e: 7%
  - 2025e: 6%
  - 2026e: 6%
CIS MARKET DYNAMICS

Quarterly and yearly CIS revenue – Total and by player (in $M)

- Q3-2020 to Q3-2021 showed -11% Q2Q decrease; the semiconductor shortage is taking its toll on image sensor production.
CIS ANNUAL REVENUE: LONG TERM

- **2021 might be lower than 2020 with slightly negative growth as a reversal of the 2019-2020 bubble.**
- **The 2022 rebound will mainly depend on Mobile market traction.**
WAFER PRODUCTION BY TECHNOLOGY

Quarterly CIS, logic and memory wafer production by technology node in kWpm and yearly average

- DRAM 32nm
- LOGIC 65-28nm
- CIS 65-45nm
- CIS 90nm
- CIS 110-140nm
- CIS 150-180nm
- LOGIC Total
- CIS Total

Quarterly CIS, logic and memory wafer production by technology node in kWpm and yearly average.
Sony CIS revenue by end-market ($M)

- **Mobile**
- **Consumer**
- **Computing**
- **Automotive**
- **Medical**
- **Security**
- **Industrial**
- **Defense & Aerospace**
- **Q2Q**
- **QoQ**

Revenue ($M): $905, $992, $1,101, $963, $825, $915, $1,403, $1,170, $1,300, $1,306, $1,550, $1,305, $793, $2,128, $2,128, $2,128, $1,996, $1,501, $1,213, $1,830, $1,884, $1,884, $1,884.

Q1-15 Q2-15 Q3-15 Q4-15 Q1-16 Q2-16 Q3-16 Q4-16 Q1-17 Q2-17 Q3-17 Q4-17 Q1-18 Q2-18 Q3-18 Q4-18 Q1-19 Q2-19 Q3-19 Q4-19 Q1-20 Q2-20 Q3-20 Q4-20 Q1-21 Q2-21 Q3-21.

Sony – Market Mix

Sony CIS revenue by end-market ($M)
YOLE GROUP OF COMPANIES RELATED ANALYSES

Yole Développement

Status of CIS Industry 2021

CCM Industry 2020

3D Imaging & Sensing 2021

Machine Vision for Industry and Automation 2021
YOLE GROUP OF COMPANIES RELATED ANALYSES

System Plus Consulting

Smartphone Camera Module Comparison 2020 Vol 3: Focus on Huawei

Smartphone Camera Module Comparison 2020 Vol 2: Focus on Samsung

Smartphone 3D Sensing Modules Comparison 2020

Apple iPad Pro LiDAR Module
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We will be more than happy to give you our latest results and appropriate formats of our approved content.

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