

# SENSOR MARKET

Global Opportunity Analysis and Industry  
Forecast, 2014-2022



REPORT CODE - SE 16257

PUBLISHED - OCT 2016



Author (s): Ayushi Bajpai,  
Gaurav Shukla, & Rachna  
Singh

5933 NE Win Sivers Drive | #205 | Portland |  
OR 97220 | United States |  
Int'l: +1 503 894 6022

## ABOUT US

---

Allied Market Research is a full-service market research and business-consulting wing of Allied Analytics LLP based in Portland, Oregon. Allied Market Research provides global enterprises as well as medium and small businesses with unmatched quality of “Market Research Reports” and “Business Intelligence Solutions”. AMR has a targeted view to provide business insights and consulting to assist its clients to make strategic business decisions and achieve sustainable growth in their respective market domain.

## TERMS OF USE

---

The electronic or hard copy of this report bears an underlying contractual agreement between Allied Market Research and the buyer. The complete or part of the content of the report cannot be shared or made available to other persons, other divisions, subsidiaries of same company or other companies. The reproduction or redistribution of the report in any manner is strictly prohibited without the prior permission of Allied Market Research. The publisher will, in-turn, regard the privacy of the purchaser and will keep it confidential. In case the purchaser wishes to share the content of the report or the report proceeds with other members or departments of company, the license type of the report should be upgraded depending upon the sharing requirement. Additional copies for this report may also be order at discounted price for use by addition readers/users.

This publication is informative material and is not meant for managerial, legal or accounting advice. It should not be used for corporate guide, laboratory manual or endorsement of any product.

## CUSTOM STUDIES

Allied Market Research also offers custom studies completely tailored to the needs of the clients in area related to this study; however, may not be covered in detail in this report. The report can be customized up to an extent of 10% within the scope of the study without any charge. For further customization, please contact us regarding such services.

## LICENSE AGREEMENT

The license terms and conditions stated herein (the "License Terms" hereafter) facilitates the use of product(s)/service(s) ("report") offered by "Allied Market Research ("AMR") in any form and is applicable to all orders (an "Order"). By placing the order, an individual ("you") on his/her own or on behalf of the 'organization', agrees to the license terms. The license terms shall be binding upon acceptance and delivery of research products (includes research reports, survey data, company profiles, custom research services and any other product created and owned by AMR) or consulting assignments by AMR and any of its authorized distributors. Our publications are available in Single-User License, Group-User License, Site-User License and Global User License. This report copy is purchased with single-user license and complies following license terms:

## SINGLE USER LICENSE

With "Single-User" license, AMR shall grant you ONE non-exclusive, non-transferable machine-readable license to use the report either electronically or online. The right to store, display, use, or stockpiling of the report should be confined only to ONE authorized computer. User will have authorization to print one duplicate of the report for individual use, yet may not be replicated for circulation. Albeit the abovementioned, you shall NOT be permitted to:

- ✓ transmit or permit by any means to any third party to use and/or gain access to the report;
- ✓ resell, sub-license, rent, lease, transfer, or attempt to assign the rights in the report (in whole or in part) to any party NOT authorized by AMR;
- ✓ modify, alter, create database, reproduce, transmit, display, copy, distribute, commercially exploit, use, or store the content from the report other than for internal business purposes; expressly permitted above; and
- ✓ Use the report in any comportment that would breach the terms and conditions contained in these License Terms or that would disregard laws in United States, India, or in any other jurisdiction.

## RELATED REPORTS

### **Proximity and Displacement Sensor Market - Global Opportunity Analysis and Industry Forecast, 2014-2022**

Proximity sensors detect the existence of objects of interest in the vicinity of the sensor. Absolute displacement as well as relative displacement of objects can be measured using displacement sensors. The growing adoption of factory and process automation across diverse industries has expanded the application areas of proximity and displacement sensors. The Asia-Pacific market has experienced an increased demand from automobile and electronics manufacturing industries.

<https://www.alliedmarketresearch.com/asia-pacific-proximity-and-displacement-sensor-market>

### **Internet of Things (IoT) healthcare Market - Global Opportunity Analysis and Industry Forecast, 2014-2021**

Internet of things (IoT), comprising components such as devices, network connectivity, electronics system and software, is basically the networking of connected devices or things to transmit the data between them without human intervention. The world internet of things in healthcare market, is expected to register considerable growth during the forecast period.

<https://www.alliedmarketresearch.com/iot-healthcare-market>



# CONTENTS

<b>CHAPTER 1</b>	<b>INTRODUCTION.....</b>	<b>33</b>
1.1.	REPORT DESCRIPTION.....	33
1.2.	KEY BENEFITS.....	35
1.3.	KEY MARKET SEGMENTS.....	36
1.4.	RESEARCH METHODOLOGY .....	37
1.4.1.	Secondary research.....	39
1.4.2.	Primary research.....	40
1.4.3.	Analyst tools and models.....	40
<b>CHAPTER 2</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>41</b>
2.1.	CXO PERSPECTIVE.....	46
<b>CHAPTER 3</b>	<b>MARKET OVERVIEW .....</b>	<b>48</b>
3.1.	MARKET DEFINITION AND SCOPE .....	48
3.2.	KEY FINDINGS .....	49
3.3.	PORTER’S FIVE FORCES ANALYSIS.....	59
3.3.1.	Bargaining power of suppliers .....	60

3.3.2.	Bargaining power of buyers .....	60
3.3.3.	Threat of substitutes.....	60
3.3.4.	Threat of new entrants.....	61
3.3.5.	Intensity of competitive rivalry .....	61
3.4.	MARKET SHARE ANALYSIS, 2015.....	62
3.5.	VALUE CHAIN ANALYSIS .....	63
3.5.1.	Raw material suppliers .....	65
3.5.2.	Conception and engineering test facilities.....	66
3.5.3.	R&D of the material .....	66
3.5.4.	Sales & distribution.....	66
3.5.5.	End users.....	67
3.6.	MARKET DYNAMICS.....	67
3.6.1.	Drivers .....	67
3.6.1.1.	Growing trend of internet of things (IoT).....	67
3.6.1.2.	Advancement in consumer electronic products fuel the adoption of sensors.....	69
3.6.1.3.	Growing trend of miniaturization in electronics.....	70
3.6.1.4.	Robust demand in automation industry .....	71

3.6.1.5. Emerging applications of radar in remote sensing.....	73
<b>3.6.2. Restraints.....</b>	<b>73</b>
3.6.2.1. Incorporating the sensor in devices incurs extra value and reduces life of device .....	73
<b>3.6.3. Opportunities.....</b>	<b>74</b>
3.6.3.1. Surge in the automotive sector .....	74
3.6.3.2. Increase in adoption of wearable devices .....	75
<b>CHAPTER 4 WORLD SENSOR MARKET, BY TYPE.....</b>	<b>76</b>
<b>4.1. OVERVIEW .....</b>	<b>77</b>
4.1.1. Market size and forecast.....	77
<b>4.2. RADAR SENSOR.....</b>	<b>79</b>
4.2.1. Key market trends.....	79
4.2.2. Growth factors and opportunities .....	81
4.2.3. Market size and forecast.....	82
<b>4.3. OPTICAL SENSOR.....</b>	<b>83</b>
4.3.2. Growth factors and opportunities .....	85
4.3.3. Market size and forecast.....	85



<b>4.4. BIOSENSOR .....</b>	<b>87</b>
<b>4.4.1. Key market trends.....</b>	<b>87</b>
<b>4.4.2. Growth factors and opportunities .....</b>	<b>89</b>
<b>4.4.3. Market size and forecast.....</b>	<b>89</b>
<b>4.5. TOUCH SENSOR.....</b>	<b>90</b>
<b>4.5.1. Key market trends.....</b>	<b>90</b>
<b>4.5.2. Growth factors and opportunities .....</b>	<b>92</b>
<b>4.5.3. Market size and forecast.....</b>	<b>92</b>
<b>4.6. IMAGE SENSOR.....</b>	<b>94</b>
<b>4.6.1. Key market trends.....</b>	<b>94</b>
<b>4.6.2. Growth factors and opportunities .....</b>	<b>96</b>
<b>4.6.3. Market size and forecast.....</b>	<b>96</b>
<b>4.7. PRESSURE SENSOR.....</b>	<b>97</b>
<b>4.7.1. Key market trends.....</b>	<b>97</b>
<b>4.7.2. Growth factors and opportunities .....</b>	<b>99</b>
<b>4.7.3. Market size and forecast.....</b>	<b>99</b>

<b>4.8. TEMPERATURE SENSOR .....</b>	<b>100</b>
4.8.1. Key market trends.....	100
4.8.2. Growth factors and opportunities .....	102
4.8.3. Market size and forecast.....	102
<b>4.9. PROXIMITY &amp; DISPLACEMENT SENSOR.....</b>	<b>103</b>
4.9.1. Key market trends.....	103
4.9.2. Growth factors and opportunities .....	105
4.9.3. Market size and forecast.....	105
<b>4.10. LEVEL SENSOR .....</b>	<b>106</b>
4.10.1. Key market trends.....	106
4.10.2. Growth factors and opportunities .....	108
4.10.3. Market size and forecast.....	108
<b>4.11. MOTION &amp; POSITION SENSOR.....</b>	<b>109</b>
4.11.1. Key market trends.....	110
4.11.2. Growth factors and opportunities .....	111
4.11.3. Market size and forecast.....	111

4.12. HUMIDITY SENSOR .....	112
4.12.1. Key market trends.....	112
4.12.2. Growth factors and opportunities .....	114
4.12.3. Market size and forecast.....	114
4.13. ACCELEROMETER & SPEED SENSOR.....	115
4.13.1. Key market trends.....	116
4.13.2. Growth factors and opportunities .....	117
4.13.3. Market size and forecast.....	117
4.14. OTHER SENSOR.....	118
4.14.1. Key market trends.....	119
4.14.2. Growth factors and opportunities .....	120
4.14.3. Market size and forecast.....	120
CHAPTER 5    WORLD SENSOR MARKET, BY TECHNOLOGY .....	122
5.1. OVERVIEW .....	123
5.1.1. Market size and forecast.....	123

<b>5.2. CMOS.....</b>	<b>125</b>
<b>5.2.1. Key market trends.....</b>	<b>125</b>
<b>5.2.2. Growth factors and opportunities .....</b>	<b>127</b>
<b>5.2.3. Market size and forecast.....</b>	<b>128</b>
<b>5.3. MEMS.....</b>	<b>129</b>
<b>5.3.1. Key market trends.....</b>	<b>129</b>
<b>5.3.2. Growth factors and opportunities .....</b>	<b>131</b>
<b>5.3.3. Market size and forecast.....</b>	<b>131</b>
<b>5.4. NEMS.....</b>	<b>132</b>
<b>5.4.1. Key market trends.....</b>	<b>132</b>
<b>5.4.2. Growth factors and opportunities .....</b>	<b>134</b>
<b>5.4.3. Market size and forecast.....</b>	<b>134</b>
<b>5.5. OTHERS (OPTICAL SPECTROSCOPY, MICROSYSTEM TECHNOLOGY, ASIC, AND HYBRID SENSOR).....</b>	<b>135</b>
<b>5.5.1. Key market trends.....</b>	<b>136</b>
<b>5.5.2. Growth factors and opportunities .....</b>	<b>137</b>
<b>5.5.3. Market size and forecast.....</b>	<b>138</b>

<b>CHAPTER 6</b>	<b>WORLD SENSOR MARKET, BY INDUSTRY VERTICAL.....</b>	<b>139</b>
6.1.	OVERVIEW .....	140
6.1.1.	Market size and forecast.....	140
6.2.	ELECTRONICS.....	142
6.2.1.	Key market trends.....	142
6.2.2.	Growth factors and opportunities .....	144
6.2.3.	Market size and forecast.....	144
6.3.	IT & TELECOMMUNICATION .....	145
6.3.1.	Key market trends.....	146
6.3.2.	Growth factors and opportunities .....	147
6.3.3.	Market size and forecast.....	147
6.4.	INDUSTRIAL .....	148
6.4.1.	Key market trends.....	149
6.4.2.	Growth factors and opportunities .....	151
6.4.3.	Market size and forecast.....	151

<b>6.5. AUTOMOTIVE.....</b>	<b>152</b>
6.5.1. Key market trends.....	152
6.5.2. Growth factors and opportunities .....	154
6.5.3. Market size and forecast.....	154
<b>6.6. AEROSPACE &amp; DEFENSE .....</b>	<b>155</b>
6.6.1. Key market trends.....	155
6.6.2. Growth factors and opportunities .....	157
6.6.3. Market size and forecast.....	157
<b>6.7. HEALTHCARE .....</b>	<b>158</b>
6.7.1. Key market trends.....	159
6.7.2. Growth factors and opportunities .....	160
6.7.3. Market size and forecast.....	160
<b>6.8. OTHERS (ENERGY AND MEDIA &amp; ENTERTAINMENT) .....</b>	<b>161</b>
6.8.1. Key market trends.....	161
6.8.2. Growth factors and opportunities .....	163
6.8.3. Market size and forecast.....	163



<b>CHAPTER 7</b>	<b>WORLD SENSOR MARKET, BY GEOGRAPHY .....</b>	<b>165</b>
<b>7.1.</b>	<b>OVERVIEW .....</b>	<b>166</b>
<b>7.2.</b>	<b>NORTH AMERICA.....</b>	<b>167</b>
<b>7.2.1.</b>	<b>Key market trends.....</b>	<b>168</b>
<b>7.2.3.</b>	<b>Market size and forecast.....</b>	<b>169</b>
<b>7.2.4.</b>	<b>U.S. ....</b>	<b>172</b>
	7.2.4.1. Market size and forecast.....	172
<b>7.2.5.</b>	<b>Canada .....</b>	<b>173</b>
	7.2.5.1. Market size and forecast.....	173
<b>7.2.6.</b>	<b>Mexico.....</b>	<b>174</b>
	7.2.6.1. Market size and forecast.....	174
<b>7.3.</b>	<b>EUROPE.....</b>	<b>175</b>
<b>7.3.1.</b>	<b>Key market trends.....</b>	<b>176</b>
<b>7.3.2.</b>	<b>Growth factors and opportunities .....</b>	<b>177</b>
<b>7.3.3.</b>	<b>Market size and forecast.....</b>	<b>178</b>
<b>7.3.4.</b>	<b>Germany .....</b>	<b>182</b>
	7.3.4.1. Market size and forecast.....	182

<b>7.3.5. U.K.....</b>	<b>183</b>
7.3.5.1. Market size and forecast.....	183
<b>7.3.6. France.....</b>	<b>184</b>
7.3.6.1. Market size and forecast.....	184
<b>7.3.7. Italy.....</b>	<b>185</b>
7.3.7.1. Market size and forecast.....	185
<b>7.3.8. Rest of Europe.....</b>	<b>186</b>
7.3.8.1. Market size and forecast.....	186
<b>7.4. ASIA-PACIFIC.....</b>	<b>187</b>
<b>7.4.1. Key market trends.....</b>	<b>188</b>
<b>7.4.2. Growth factors and opportunities .....</b>	<b>189</b>
<b>7.4.3. Market size and forecast.....</b>	<b>191</b>
<b>7.4.4. China .....</b>	<b>195</b>
7.4.4.1. Market size and forecast.....	195
<b>7.4.5. India .....</b>	<b>196</b>
7.4.5.1. Market size and forecast.....	196

<b>7.4.6. Japan .....</b>	<b>197</b>
7.4.6.1. Market size and forecast .....	197
<b>7.4.7. South Korea .....</b>	<b>198</b>
7.4.7.1. Market size and forecast .....	198
<b>7.4.8. Taiwan.....</b>	<b>199</b>
7.4.8.1. Market size and forecast .....	199
<b>7.4.9. Rest of Asia-Pacific.....</b>	<b>200</b>
7.4.9.1. Market size and forecast.....	200
<b>7.5. LAMEA .....</b>	<b>201</b>
7.5.1. Key market trends.....	203
7.5.2. Growth factors and opportunities .....	203
7.5.3. Market size and forecast.....	204
7.5.4. Latin America .....	209
7.5.4.1. Market size and forecast .....	209
7.5.5. Middle East .....	209
7.5.5.1. Market size and forecast.....	210

7.5.6.	Africa .....	211
7.5.6.1.	Market size and forecast .....	211
<b>CHAPTER 8</b>	<b>COMPANY PROFILES.....</b>	<b>212</b>
<b>8.1.</b>	<b>STMICROELECTRONICS N.V.....</b>	<b>212</b>
8.1.1.	Company overview .....	212
8.1.2.	Operating business segments .....	215
8.1.3.	Business performance.....	215
8.1.4.	Key strategic moves and developments .....	215
<b>8.2.</b>	<b>NXP SEMICONDUCTORS N.V.....</b>	<b>216</b>
8.2.1.	Company overview .....	217
8.2.2.	Operating business segments .....	220
8.2.3.	Business performance.....	220
8.2.4.	Key strategic moves and developments .....	220
<b>8.3.</b>	<b>INFINEON TECHNOLOGIES AG .....</b>	<b>222</b>
8.3.1.	Company overview.....	222
8.3.2.	Operating business segments .....	225
8.3.3.	Business performance.....	225

8.3.4.	Key strategic moves and developments .....	226
8.4.	QUALCOMM TECHNOLOGIES, INC. ....	227
8.4.1.	Company overview .....	227
8.4.2.	Operating business segments .....	230
8.4.3.	Business performance.....	231
8.4.4.	Key strategic moves and developments .....	231
8.5.	ATMEL CORPORATION.....	233
8.5.1.	Company overview.....	233
8.5.2.	Operating business segments .....	236
8.5.3.	Business performance.....	236
8.5.4.	Key strategic moves and developments .....	237
8.6.	TEXAS INSTRUMENTS INC.....	238
8.6.1.	Company overview .....	238
8.6.2.	Operating business segments .....	241
8.6.3.	Business performance.....	241
8.6.4.	Key strategic moves and developments .....	242

<b>8.7. ROBERT BOSCH GMBH .....</b>	<b>243</b>
8.7.1. Company overview .....	243
8.7.2. Operating business segments .....	247
8.7.3. Business performance .....	247
8.7.4. Key strategic moves and developments .....	248
<b>8.8. JOHNSON CONTROLS INTERNATIONAL PLC .....</b>	<b>249</b>
8.8.1. Company overview .....	249
8.8.2. Operating business segments .....	252
8.8.3. Business performance .....	252
8.8.4. Key strategic moves and developments .....	253
<b>8.9. SONY CORPORATION .....</b>	<b>254</b>
8.9.1. Company overview .....	254
8.9.2. Operating business segments .....	257
8.9.3. Business performance .....	258
8.9.4. Key strategic moves and developments .....	258



<b>8.10. HONEYWELL INTERNATIONAL INC.</b> .....	<b>260</b>
<b>8.10.1. Company overview</b> .....	<b>260</b>
<b>8.10.2. Operating business segments</b> .....	<b>263</b>
<b>8.10.4. Key strategic moves and developments</b> .....	<b>264</b>

# LIST OF TABLES

TABLE 1	CONSUMER ELECTRONIC DEVICES AND THEIR SENSORS WITH SPECIAL FEATURES.....	69
TABLE 2	LIST OF FEW SENSORS AND THEIR USAGE IN SMARTPHONES.....	70
TABLE 3	SENSOR MARKET, BY TYPE, 2014–2022 (\$MILLION) .....	77
TABLE 4	RADAR SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION) .....	82
TABLE 5	OPTICAL SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	87
TABLE 6	BIOSENSOR MARKET, BY REGION, 2014–2022 (\$MILLION) .....	90
TABLE 7	TOUCH SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	93
TABLE 8	IMAGE SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	97
TABLE 9	PRESSURE SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION) .....	100
TABLE 10	TEMPERATURE SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	103
TABLE 11	PROXIMITY & DISPLACEMENT SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION) .....	106
TABLE 12	LEVEL SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	109
TABLE 13	MOTION & POSITION SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	112
TABLE 14	HUMIDITY SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION) .....	115
TABLE 15	ACCELEROMETER & SPEED SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION) .....	118

TABLE 16	OTHER SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION) .....	121
TABLE 17	SENSOR MARKET, BY TECHNOLOGY, 2014–2022 (\$MILLION) .....	123
TABLE 18	CMOS SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	128
TABLE 19	MEMS SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION) .....	132
TABLE 20	NEMS MARKET, BY REGION, 2014–2022 (\$MILLION) .....	135
TABLE 21	OTHERS SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	138
TABLE 22	SENSOR MARKET, BY INDUSTRY VERTICAL, 2014–2022 (\$MILLION) .....	140
TABLE 23	ELECTRONICS SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	145
TABLE 24	IT & TELECOMMUNICATION SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION) .....	148
TABLE 25	INDUSTRIAL SENSOR MARKET, BY GEOGRAPHY, 2014–2022 (\$MILLION).....	152
TABLE 26	AUTOMOTIVE SENSOR MARKET, BY GEOGRAPHY, 2014–2022 (\$MILLION).....	155
TABLE 27	AEROSPACE & DEFENSE SENSOR MARKET, BY GEOGRAPHY, 2014–2022 (\$MILLION) .....	158
TABLE 28	HEALTHCARE SENSOR MARKET, BY GEOGRAPHY, 2014–2022 (\$MILLION).....	161
TABLE 29	OTHERS SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	164
TABLE 30	SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION).....	166
TABLE 31	NORTH AMERICA: SENSOR MARKET, BY TYPE, 2014–2022 (\$MILLION) .....	170
TABLE 32	NORTH AMERICA: SENSOR MARKET, BY TECHNOLOGY, 2014–2022 (\$MILLION) .....	170

TABLE 33	NORTH AMERICA: SENSOR MARKET, BY INDUSTRY VERTICAL, 2014–2022 (\$MILLION) .....	171
TABLE 34	NORTH AMERICA: SENSOR MARKET, BY COUNTRY, 2014–2022 (\$MILLION) .....	171
TABLE 35	EUROPE: SENSOR MARKET, BY TYPE, 2014–2022 (\$MILLION) .....	179
TABLE 36	EUROPE: SENSOR MARKET, BY TECHNOLOGY, 2014–2022 (\$MILLION).....	180
TABLE 37	EUROPE: SENSOR MARKET, BY INDUSTRY VERTICAL, 2014–2022 (\$MILLION).....	180
TABLE 38	EUROPE: SENSOR MARKET, BY COUNTRY, 2014–2022 (\$MILLION) .....	181
TABLE 39	ASIA-PACIFIC: SENSOR MARKET, BY TYPE, 2014–2022 (\$MILLION) .....	192
TABLE 40	ASIA-PACIFIC: SENSOR MARKET, BY TECHNOLOGY, 2014–2022 (\$MILLION) .....	193
TABLE 41	ASIA-PACIFIC: SENSOR MARKET, BY INDUSTRY VERTICAL, 2014–2022 (\$MILLION) .....	193
TABLE 42	ASIA-PACIFIC: SENSOR MARKET, BY COUNTRY, 2014–2022 (\$MILLION).....	194
TABLE 43	LAMEA: SENSOR MARKET, BY TYPE, 2014–2022 (\$MILLION).....	205
TABLE 44	LAMEA: SENSOR MARKET, BY TECHNOLOGY, 2014–2022 (\$MILLION).....	206
TABLE 45	LAMEA: SENSOR MARKET, BY INDUSTRY VERTICAL, 2014–2022 (\$MILLION).....	207
TABLE 46	LAMEA: SENSOR MARKET, BY COUNTRY, 2014–2022 (\$MILLION).....	208
TABLE 47	STMICROELECTRONICS: COMPANY SNAPSHOT .....	212
TABLE 48	STMICROELECTRONICS: OPERATING SEGMENTS .....	215
TABLE 49	NXP SEMICONDUCTOR: COMPANY SNAPSHOT .....	218
TABLE 50	NXP SEMICONDUCTOR: OPERATING SEGMENTS .....	220

TABLE 51	INFINEON TECHNOLOGIES: COMPANY SNAPSHOT.....	223
TABLE 52	INFINEON TECHNOLOGIES: OPERATING SEGMENTS .....	225
TABLE 53	QUALCOMM TECHNOLOGIES: COMPANY SNAPSHOT.....	228
TABLE 54	QUALCOMM TECHNOLOGIES: OPERATING SEGMENTS.....	230
TABLE 55	ATMEL CORPORATION: COMPANY SNAPSHOT .....	234
TABLE 56	ATMEL CORPORATION: OPERATING SEGMENTS .....	236
TABLE 57	TEXAS INSTRUMENTS: COMPANY SNAPSHOT.....	239
TABLE 58	TEXAS INSTRUMENTS: OPERATING SEGMENTS.....	241
TABLE 59	ROBERT BOSCH: COMPANY SNAPSHOT .....	245
TABLE 60	ROBERT BOSCH: OPERATING SEGMENTS .....	247
TABLE 61	JOHNSON CONTROLS: COMPANY SNAPSHOT .....	250
TABLE 62	JOHNSON CONTROLS: OPERATING SEGMENTS.....	252
TABLE 63	SONY CORPORATION: COMPANY SNAPSHOT .....	255
TABLE 64	SONY CORPORATION: OPERATING SEGMENTS .....	257
TABLE 65	HONEYWELL INTERNATIONAL: COMPANY SNAPSHOT.....	261
TABLE 66	HONEYWELL INTERNATIONAL: OPERATING SEGMENTS.....	263

# LIST OF FIGURES

FIGURE 1.	MARKET SEGMENTATIONS .....	36
FIGURE 2.	SENSOR MARKET SEGMENTS, REVENUE & CAGR, 2014-2022 .....	42
FIGURE 3.	SENSOR MARKET, BY GEOGRAPHY, REVENUE & CAGR, 2014-2022 .....	44
FIGURE 4.	TOP IMPACTING FACTORS.....	49
FIGURE 5.	TOP WINNING STRATEGIES: PERCENTAGE DISTRIBUTION (2014 – 2016) .....	53
FIGURE 6.	TOP WINNING STRATEGIES: NATURE AND TYPE.....	56
FIGURE 7.	TOP INVESTMENT POCKETS IN SENSOR MARKET, BY TECHNOLOGY .....	57
FIGURE 8.	PORTER'S FIVE FORCES ANALYSIS.....	59
FIGURE 9.	MARKET SHARE ANALYSIS, 2015.....	62
FIGURE 10.	VALUE CHAIN ANALYSIS.....	64
FIGURE 11.	INCREASE IN NUMBER OF CONNECTED DEVICES ACROSS THE GLOBE AFTER THE INCEPTION OF INTERNET OF THINGS.....	68
FIGURE 12.	WORLDWIDE SUPPLY OF ROBOTS (THOUSANDS) .....	71
FIGURE 13.	WORLD SENSOR MARKET, BY TYPE.....	76
FIGURE 14.	WORLD SENSOR MARKET, BY TYPE, REVENUE & CAGR.....	78
FIGURE 15.	RADAR SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION).....	80



FIGURE 16.	MARKET REVENUE & FORECAST OF RADAR SENSOR MARKET, 2014–2022 (\$MILLION) .....	81
FIGURE 17.	OPTICAL SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	83
FIGURE 18.	MARKET REVENUE & FORECAST OF OPTICAL SENSOR MARKET, 2014–2022 (\$MILLION) .....	84
FIGURE 19.	BIOSENSOR SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	88
FIGURE 20.	MARKET REVENUE & FORECAST OF BIOSENSOR SENSOR MARKET, 2014–2022 (\$MILLION) .....	88
FIGURE 21.	TOUCH SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	91
FIGURE 22.	MARKET REVENUE & FORECAST OF TOUCH SENSOR MARKET, 2014–2022 (\$MILLION) .....	92
FIGURE 23.	IMAGE SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	94
FIGURE 24.	MARKET REVENUE & FORECAST OF IMAGE SENSOR MARKET, 2014–2022 (\$MILLION) .....	95
FIGURE 25.	PRESSURE SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION).....	98
FIGURE 26.	MARKET REVENUE & FORECAST OF PRESSURE SENSOR MARKET, 2014–2022 (\$MILLION) .....	98
FIGURE 27.	TEMPERATURE SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	101
FIGURE 28.	MARKET REVENUE & FORECAST OF TEMPERATURE SENSOR MARKET, 2014–2022 (\$MILLION).....	101
FIGURE 29.	PROXIMITY & DISPLACEMENT SENSOR MARKET ANALYSIS, 2015 (\$MILLION).....	104

FIGURE 30.	MARKET REVENUE & FORECAST OF PROXIMITY & DISPLACEMENT SENSOR MARKET, 2014–2022 (\$MILLION).....	104
FIGURE 31.	LEVEL SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION).....	107
FIGURE 32.	MARKET REVENUE & FORECAST OF LEVEL SENSOR MARKET, 2014–2022 (\$MILLION) .....	108
FIGURE 33.	MOTION & POSITION SENSOR MARKET ANALYSIS, 2015 (\$MILLION).....	110
FIGURE 34.	MARKET REVENUE & FORECAST OF MOTION & POSITION SENSOR MARKET, 2014–2022 (\$MILLION).....	111
FIGURE 35.	HUMIDITY SENSOR MARKET ANALYSIS, 2015 (\$MILLION) .....	113
FIGURE 36.	MARKET REVENUE & FORECAST OF HUMIDITY SENSOR MARKET, 2014–2022 (\$MILLION) .....	114
FIGURE 37.	ACCELEROMETER & SPEED SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	116
FIGURE 38.	MARKET REVENUE & FORECAST OF ACCELEROMETER & SPEED SENSOR MARKET, 2014–2022 (\$MILLION).....	117
FIGURE 39.	OTHERS SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION).....	119
FIGURE 40.	MARKET REVENUE & FORECAST OF OTHERS SENSOR MARKET, 2014–2022 (\$MILLION) .....	120
FIGURE 41.	WORLD SENSOR MARKET, BY TECHNOLOGY .....	122
FIGURE 42.	WORLD SENSOR MARKET, BY TECHNOLOGY, REVENUE & CAGR.....	124
FIGURE 43.	CMOS SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	126

FIGURE 44.	MARKET REVENUE & FORECAST OF CMOS SENSOR MARKET, 2014–2022 (\$MILLION) .....	127
FIGURE 45.	MEMS SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	129
FIGURE 46.	MARKET REVENUE & FORECAST OF MEMS SENSOR MARKET, 2014–2022 (\$MILLION) .....	130
FIGURE 47.	NEMS SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	133
FIGURE 48.	MARKET REVENUE & FORECAST OF NEMS SENSOR MARKET, 2014–2022 (\$MILLION) .....	133
FIGURE 49.	OTHERS SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION).....	136
FIGURE 50.	MARKET REVENUE & FORECAST OF OTHERS SENSOR MARKET, 2014–2022 (\$MILLION) .....	137
FIGURE 51.	WORLD SENSOR MARKET, BY INDUSTRY VERTICAL.....	139
FIGURE 52.	WORLD SENSOR MARKET, BY INDUSTRY VERTICAL, REVENUE & CAGR .....	141
FIGURE 53.	ELECTRONICS SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION).....	142
FIGURE 54.	MARKET REVENUE & FORECAST OF ELECTRONICS SENSOR MARKET, 2014–2022 (\$MILLION) .....	143
FIGURE 55.	IT & TELECOMMUNICATION SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	146
FIGURE 56.	MARKET REVENUE & FORECAST OF IT & TELECOMMUNICATION SENSOR MARKET, 2014–2022 (\$MILLION).....	147
FIGURE 57.	INDUSTRIAL SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	149

FIGURE 58.	MARKET REVENUE & FORECAST OF INDUSTRIAL SENSOR MARKET, 2014–2022 (\$MILLION) .....	150
FIGURE 59.	AUTOMOTIVE SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION).....	153
FIGURE 60.	MARKET REVENUE & FORECAST OF AUTOMOTIVE SENSOR MARKET, 2014–2022 (\$MILLION) .....	153
FIGURE 61.	AEROSPACE & DEFENSE SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION) .....	156
FIGURE 62.	MARKET REVENUE & FORECAST OF AEROSPACE & DEFENSE SENSOR MARKET, 2014–2022 (\$MILLION).....	157
FIGURE 63.	HEALTHCARE SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION).....	159
FIGURE 64.	MARKET REVENUE & FORECAST OF HEALTHCARE SENSOR MARKET, 2014–2022 (\$MILLION) .....	159
FIGURE 65.	OTHERS SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION).....	162
FIGURE 66.	MARKET REVENUE & FORECAST OF OTHERS SENSOR MARKET, 2014–2022 (\$MILLION) .....	162
FIGURE 67.	WORLD SENSOR MARKET, BY GEOGRAPHY .....	165
FIGURE 68.	NORTH AMERICA SENSOR MARKET .....	167
FIGURE 69.	NORTH AMERICA SENSOR MARKET, REVENUE & CAGR, 2015-2022.....	169
FIGURE 70.	U.S.: SENSOR MARKET SIZE, 2014-2022 (\$MILLION) .....	172
FIGURE 71.	CANADA: SENSOR SIZE, 2014-2022 (\$MILLION) .....	173
FIGURE 72.	MEXICO: SENSOR MARKET SIZE, 2014-2022 (\$MILLION).....	174
FIGURE 73.	EUROPEAN SENSOR MARKET.....	175

FIGURE 74.	EUROPE SENSOR MARKET, REVENUE & CAGR, 2015-2022.....	178
FIGURE 75.	GERMANY: SENSOR MARKET SIZE, 2014-2022 (\$MILLION).....	182
FIGURE 76.	U.K.: SENSOR MARKET SIZE, 2014-2022 (\$MILLION).....	183
FIGURE 77.	FRANCE: SENSOR MARKET SIZE, 2014-2022 (\$MILLION).....	184
FIGURE 78.	ITALY: SENSOR MARKET SIZE, 2014-2022 (\$MILLION).....	185
FIGURE 79.	REST OF EUROPE: SENSOR MARKET SIZE, 2014-2022 (\$MILLION) .....	186
FIGURE 80.	ASIA-PACIFIC SENSOR MARKET.....	187
FIGURE 81.	ASIA-PACIFIC SENSOR MARKET, REVENUE & CAGR, 2015-2022 .....	191
FIGURE 82.	CHINA: SENSOR MARKET SIZE, 2014-2022 (\$MILLION) .....	195
FIGURE 83.	INDIA: SENSOR MARKET SIZE, 2014-2022 (\$MILLION).....	196
FIGURE 84.	JAPAN: SENSOR MARKET SIZE, 2014-2022 (\$MILLION) .....	197
FIGURE 85.	SOUTH KOREA: SENSOR MARKET SIZE, 2014-2022 (\$MILLION).....	198
FIGURE 86.	TAIWAN: SENSOR MARKET SIZE, 2014-2022 (\$MILLION) .....	199
FIGURE 87.	REST OF ASIA-PACIFIC: SENSOR MARKET SIZE, 2014-2022 (\$MILLION).....	200
FIGURE 88.	LAMEA SENSOR MARKET .....	201
FIGURE 89.	LAMEA SENSOR MARKET, REVENUE & CAGR, 2015-2022 .....	204
FIGURE 90.	LATIN AMERICA: SENSOR MARKET SIZE, 2014-2022 (\$MILLION) .....	209
FIGURE 91.	MIDDLE EAST: SENSOR MARKET SIZE, 2014-2022 (\$MILLION) .....	210
FIGURE 92.	AFRICA: SENSOR MARKET SIZE, 2014-2022 (\$MILLION).....	211

FIGURE 93.	COMPANY SNAPSHOT.....	214
FIGURE 94.	COMPANY SNAPSHOT.....	219
FIGURE 95.	COMPANY SNAPSHOT.....	224
FIGURE 96.	COMPANY SNAPSHOT.....	229
FIGURE 97.	COMPANY SNAPSHOT.....	235
FIGURE 98.	COMPANY SNAPSHOT.....	240
FIGURE 99.	COMPANY SNAPSHOT.....	246
FIGURE 100.	COMPANY SNAPSHOT.....	251
FIGURE 101.	COMPANY SNAPSHOT.....	256
FIGURE 102.	COMPANY SNAPSHOT.....	262



# CHAPTER 1 INTRODUCTION

## 1.1. REPORT DESCRIPTION

Sensors are devices that detect events or changes in their environment and then provide the corresponding output. They sense physical input such as light, heat, motion, moisture, pressure, or any other entity, and respond by producing an output on a display or transmit the information in electronic form for further processing. These define major applications in flood & water level monitoring systems, environmental monitoring, traffic monitoring & controlling, energy saving in artificial lighting, remote system monitoring & equipment fault diagnostics, and precision agriculture & animal tracking, among many more.

Recent advances in ubiquitous computing, miniature as well as mobile devices, have nurtured a vivid growth of wearable technologies. Wearable biosensor systems are an emerging trend and are expected to be revolutionary in many application areas, ranging from cardiovascular monitoring to battle field monitoring, and sports medicine. Furthermore, infrastructure systems such as smart grid, smart homes, smart water networks, and intelligent transportation connect our world through the concept of Internet of Things (IoT), where there is extensive use of sensors. The entire physical infrastructure is closely coupled with information and communication technologies, where intelligent monitoring and management can be achieved via the usage of networked embedded devices having sensors.

The world sensor market is segmented based on type, into radar sensor, optical sensor, biosensors, touch sensor, image sensor, pressure sensor, temperature sensor, proximity and displacement sensor, level sensor, motion and position sensor, humidity sensor, accelerometer and speed sensor, and others. On the basis of technology, the market comprises of complementary metal–oxide–semiconductor (CMOS), micro-electromechanical systems (MEMS), Nano-electromechanical systems (NEMS), and others. Furthermore, the market is categorized on the basis of industry vertical, which includes electronics, IT & telecommunication, industrial, automotive, aerospace & defense, healthcare, and others. The market is analyzed on the basis of four regions, namely, North America, Europe, Asia-Pacific, and LAMEA.

Key players profiled in this report are STMicroelectronics, NXP semiconductors, Infineon Technologies AG, Qualcomm Technologies, Inc., Atmel Corporation, Texas instruments Incorporated, Robert Bosch GmbH, Johnson controls, Sony Corporation, and Honeywell International Inc. among others.

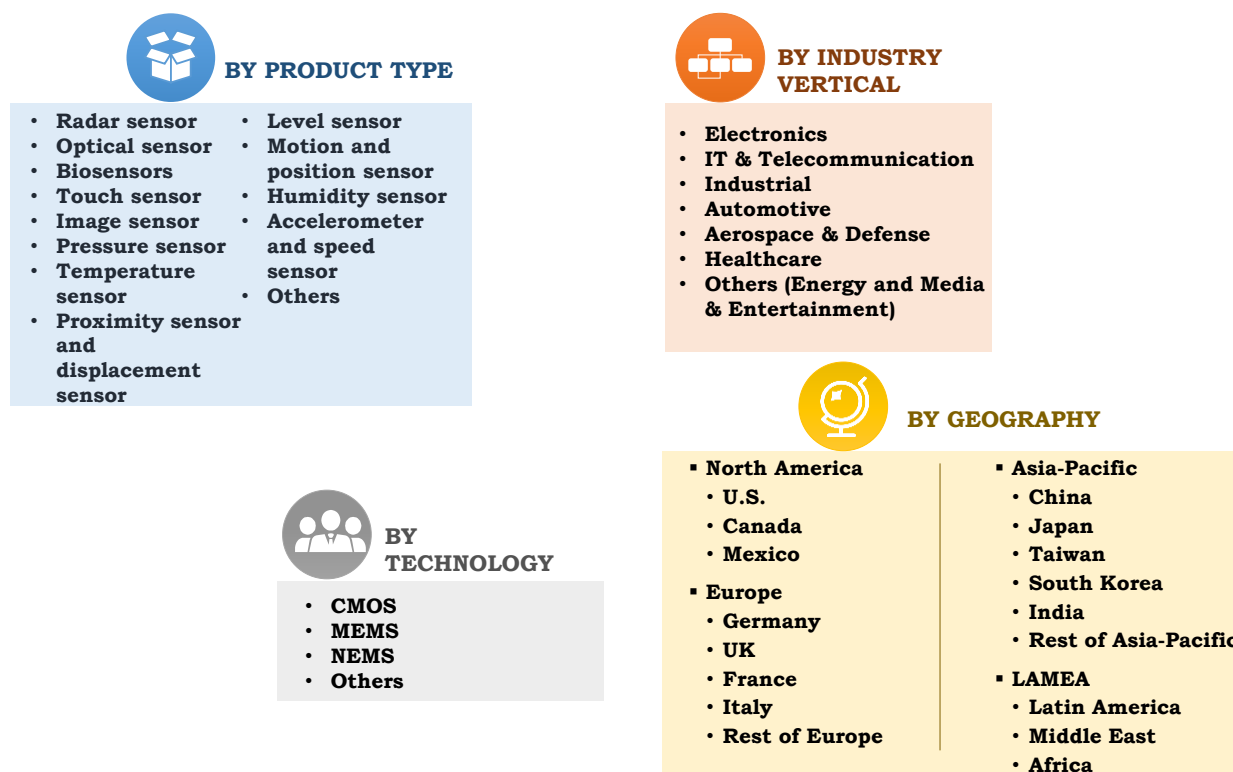
### 1.2. KEY BENEFITS

- ✓ The report provides an in-depth analysis of the sensor market across major geographies as well as the estimated revenues generated during the forecast period.
- ✓ Quantitative analysis of the current market and estimations from 2014 to 2022 in order to help the manufacturers of sensors to analyze the market.
- ✓ The entire projections in the report are based on analysis of the current market trends and highlight the market potential for the period of 2016–2022, in terms of value.
- ✓ The report conducts extensive analysis of the market by closely following key product positioning and monitoring the top contenders within the market framework.
- ✓ The report also provides quantitative as well as qualitative market trends to help the stakeholders in understanding the situations prevailing in the market.

### 1.3. KEY MARKET SEGMENTS

The world sensor market segmentation is illustrated below.

**FIGURE 1. MARKET SEGMENTATIONS**



Source: AMR Analysis

## 1.4. RESEARCH METHODOLOGY

With collective industry experience of about 200 years of its analysts and experts, Allied Market Research (AMR) encompasses the most infallible research methodology for its market intelligence and industry analysis. We not only engrave the deepest levels of markets but also sneak through its slimmest details for the purpose of our market estimates and forecasts. Our approach helps in building greater market consensus view for size, shape, and industry trends within each industry segment. We carefully factor industry trends and real developments for identifying key growth factors and future course of the market. Our research proceeds are the resultant of high-quality data, expert views and analysis, and high-value independent opinions. Our research process is designed to deliver a balanced view of the global markets and allow stakeholders to make informed decisions to attain their highest growth objectives. AMR offers its clients exhaustive research and analysis, based on a wide variety of factual inputs, which largely include interviews with industry participants, reliable statistics, and regional intelligence. The in-house industry experts play an instrumental role in designing analytic tools and models, tailored to the requirements of a particular industry segment. These analytical tools and models distill the data & statistics and enhance the accuracy of our recommendations and advice. With AMR's calibrated research process and 360-degree data evaluation methodology, the clients receive:

- Consistent, valuable, robust, and actionable data & analysis that can easily be referenced for strategic business planning
- Technologically sophisticated and reliable insights through well-audited and veracious research methodology
- Sovereign research proceeds that present a tangible depiction of the marketplace

With a strong methodology AMR ensures that its research and analysis is most reliable and guarantees sound business planning

For this research report, over 12 hours of interviews and discussion have been conducted, with a wide range of stakeholders, including upstream and downstream participants. Primary research typically is a bulk of our research efforts; but it is coherently supported by extensive secondary research. Over 2,756 product literatures, industry releases, annual reports, and other such documents of key industry participants, have been reviewed to understand the market better and gain competitive intelligence. In addition, authentic industry journals, trade association releases, and government websites have also been reviewed for generating high-value industry insights.

### 1.4.1. Secondary research

AMR refers to a broad array of industry sources for our secondary, which typically include; but is not limited to:

- Company SEC filings, annual reports, company websites, broker & financial reports, and investor presentations for competitive scenario and shape of the industry
- Patent and regulatory databases for understanding of technical & legal developments
- Scientific and technical writings for product information and related preemptions
- Regional government and statistical databases for macro-analysis
- Authentic new articles, web-casts, and other related releases for market evaluation
- Internal and external proprietary databases, key market indicators, and relevant press releases for market estimates and forecasts.

### 1.4.2. Primary research

The primary research efforts include reaching out to participants through mail, tele-conversations, referrals, professional networks, and face-to-face interactions. AMR also maintains professional corporate relations with various companies that allow us greater flexibility in reaching out to industry participants and commentators for interviews and discussions, which fulfills the following functions:

- Validates and improves the data quality and strengthens research proceeds
- Further develops analyst team's market understanding and expertise
- Supplies authentic information about market size, share, growth, and forecast

The primary research interview and discussion panels are typically composed of the most experienced industry members. These participants include, however, are not limited to:

- Chief executives and VPs of leading corporations specific to the industry
- Product and sales managers or country heads; channel partners and top-level distributors; banking, investment, and valuation experts
- Key opinion leaders (KOLs)

### 1.4.3. Analyst tools and models

AMR has developed set of analyst tools and data models to supplement and expedite the analysis process. Corresponding to markets, where there is significant lack of information and estimates, to translate qualitative and quantitative industry indicators into exact industry estimates. These models also allow analysts to examine the prospects and opportunities prevailing in the market to accurately forecast the course of the market.



## CHAPTER 3 MARKET OVERVIEW

### 3.1. MARKET DEFINITION AND SCOPE

The report analyzes the world sensor market including technologies used for manufacturing and different types of sensors. Sensor is a device that detects physical input such as light, heat, motion, moisture, pressure, or any other entity, and responds by producing an output on a display or transmits the information in electronic form for further processing. The sensor types included are radar sensor, optical sensor, biosensors, touch sensor, image sensor, pressure sensor, temperature sensor, proximity sensor and displacement sensor, level sensor, motion and position sensor, humidity sensor, accelerometer and speed sensor, and others.

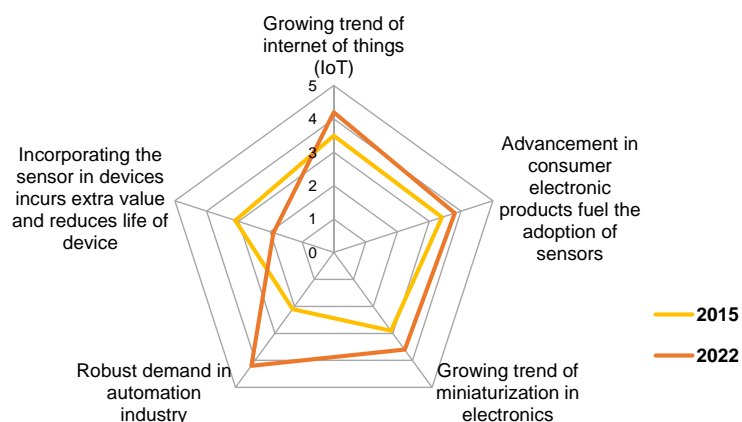
The Technology segment is sub-segmented into CMOS, MEMS, NEMS, and others; Industry vertical segment is divided into electronics, IT & telecommunication, industrial, automotive, aerospace & defense, healthcare, and others (renewable energy and media & entertainment). Geographically, the market is analyzed across North America, Europe, Asia-Pacific, and LAMEA. Asia-Pacific significantly contributed to the global market in 2015, and is projected to maintain this trend during the forecast period. It has emerged as the largest market for sensors due to considerable growth of consumer electronic and photovoltaic industries in developing countries such as China, India, and Taiwan. Further, the report covers Porter's five forces and value chain analyses of the market, which comprises of raw material suppliers, sensor manufacturers, and end users that assist stakeholders to devise appropriate strategies and develop their businesses. The key manufactures operating in the market are STMicroelectronics, NXP semiconductors, Infineon Technologies AG, Qualcomm Technologies, Inc., Atmel Corporation, Texas instruments Incorporated, Robert Bosch GmbH, Johnson controls, Sony Corporation, and Honeywell International Inc. among others.

## 3.2. KEY FINDINGS

### 3.2.1. Top Impacting Factors

**Growing trend of internet of things (IoT);** Sensors are intrinsic components for the Internet of Things (IoT) technology to function properly. IoT works on the basis of feedback given by various sensors installed on the devices connected together through wireless network. The number of connected devices through IoT has considerably increased in last 4-5 years, and the government initiatives in developed nations and investment by major companies ensure that this trend will continue in years to come which will foster the demand of sensors.

**FIGURE 4. TOP IMPACTING FACTORS**



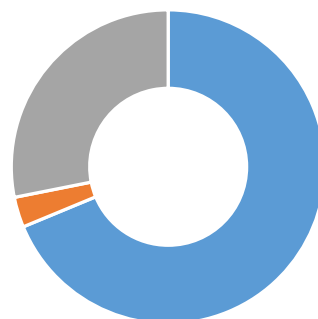
Source: Primary Research, Secondary Research, Company Releases, and AMR Analysis

### 3.2.2. Top winning strategies

The leading players in the world sensor market have adopted various strategies to garner additional market share. The information for strategic analysis presented in this section is gathered from the press releases and annual reports of market players; and are limited to publicly available information and primary calls. The key strategies adopted by the players include:

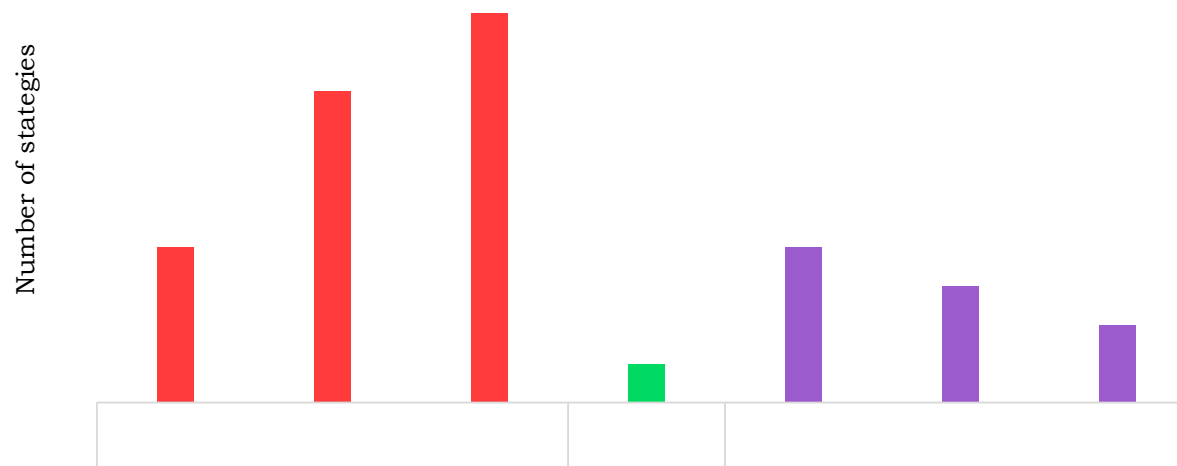
- ✓ **Product launches:** Launch of new products with improved features and applications.
- ✓ **Partnerships:** Joint ventures, agreements, or collaborations by market players in order to enhance capabilities and market reach.
- ✓ **Expansion:** Extending the market reach in terms of geographies, product portfolio, or other aspects.

**FIGURE 5. TOP WINNING STRATEGIES: PERCENTAGE DISTRIBUTION  
(2014 – 2016)**



Source: Primary Research, Secondary Research, Company Releases, and AMR Analysis

**FIGURE 6. TOP WINNING STRATEGIES: NATURE AND TYPE**



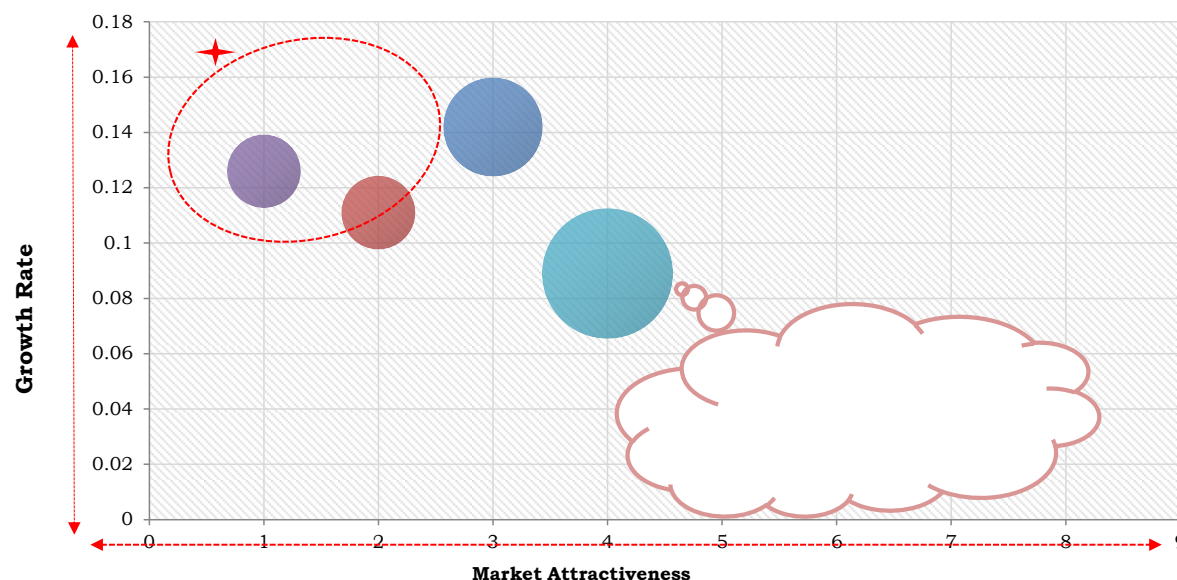
*Note: The chart highlights key growth opportunities by adopting various strategies e.g. Acquisitions can help in expansions and strengthening product offerings*

*Source: Primary Research, Secondary Research, Company Releases, and AMR Analysis*

### 3.2.3. Top investment pockets

The world sensor market is segmented based on type, technology, industry vertical, and geography. The technology market is further segmented into four categories mainly complementary metal–oxide–semiconductor (CMOS), micro-electro-mechanical systems (MEMS), nano-electro-mechanical systems (NEMS), and others (optical spectroscopy, microsystem technology, application-specific integrated circuit, and hybrid sensor).

**FIGURE 7. TOP INVESTMENT POCKETS IN SENSOR MARKET, BY TECHNOLOGY**



*Note: The highlighted portion reflects the top two investment segments for stakeholders since they are growing and have higher opportunity in the World sensor market during the forecast period*

*Source: Primary Research, Government Publications, Company Releases, and AMR Analysis*

### 3.4. MARKET SHARE ANALYSIS, 2015

**FIGURE 9. MARKET SHARE ANALYSIS, 2015**

---

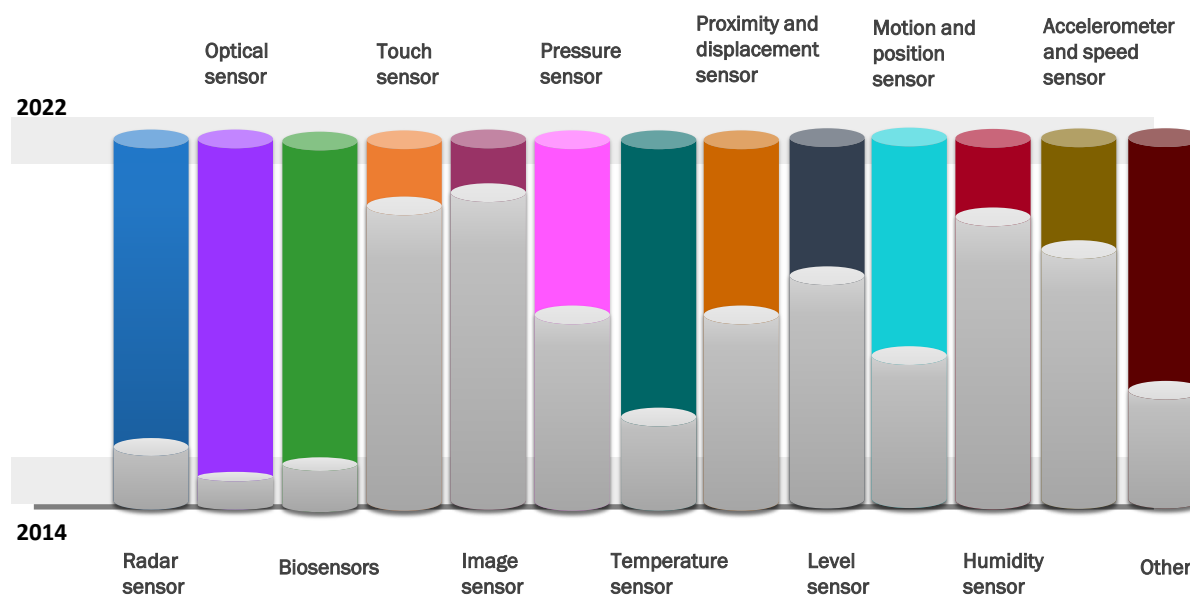


---

*Source: Primary Research, Government Publications, Company Releases, and AMR Analysis*

## CHAPTER 4 WORLD SENSOR MARKET, BY TYPE

**FIGURE 13. WORLD SENSOR MARKET, BY TYPE**



Source: AMR analysis and Secondary Research



## 4.1. OVERVIEW

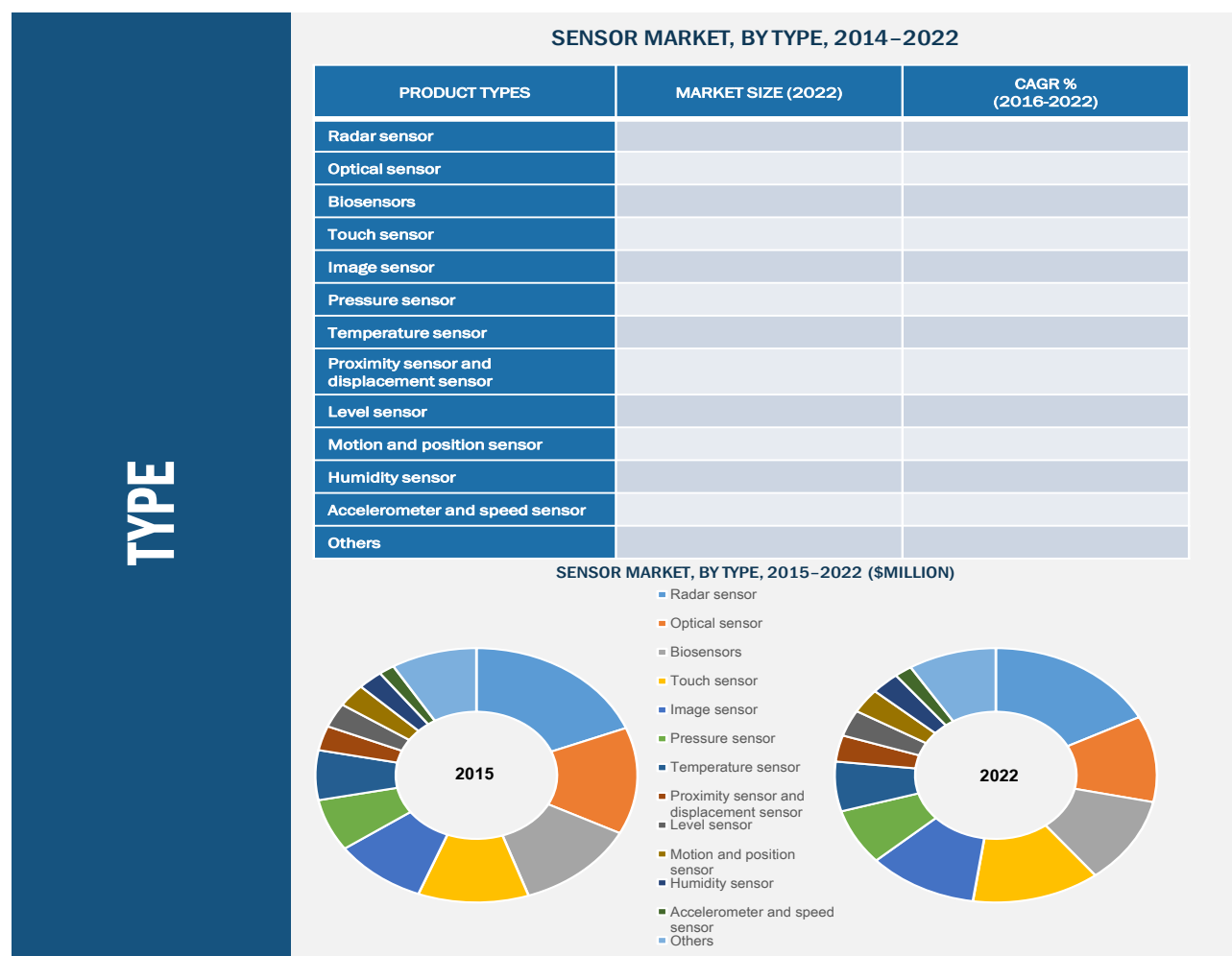
Sensor types comprise of image sensor, proximity sensor & displacement sensor, optical sensor, touch sensor, biosensors, level sensor, pressure sensor, temperature sensor, humidity sensor, radar sensors, accelerometer & speed sensor, motion & position sensor, and others. Image sensors have emerged as the most popular sensors and are under extensive research and development.

### 4.1.1. Market size and forecast

**TABLE 3      SENSOR MARKET, BY TYPE, 2014–2022 (\$MILLION)**

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR% (2016–2022)
Radar sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Optical sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Biosensors	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Touch sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Image sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Pressure sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Temperature sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Proximity sensor and displacement sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Level sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Motion and position sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Humidity sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Accelerometer and speed sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Others	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Total	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

**FIGURE 14. WORLD SENSOR MARKET, BY TYPE, REVENUE & CAGR**


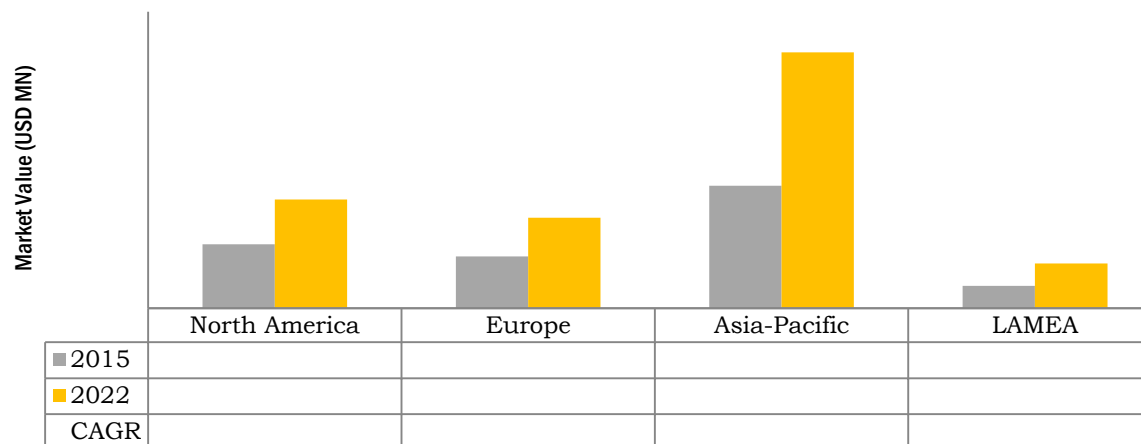
Source: AMR analysis and Secondary Research

## 4.2. RADAR SENSOR

Radar sensors transmit radiations at radio frequency and use the intercepted return to derive the properties of the earth's surface. Radar sensors provide very unique advantages in varied applications in automotive, aerospace & defense, industrial, security & surveillance, traffic monitoring & management, environmental & weather monitoring, medical, healthcare, agricultural sectors, and applications in construction machines and smart electronic devices.

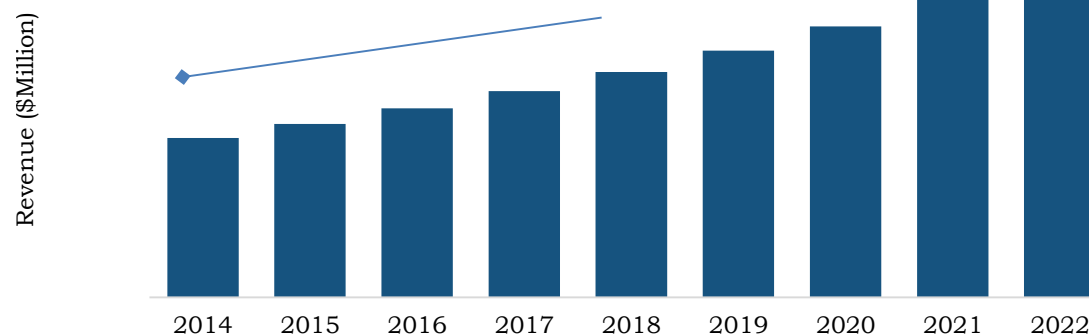
### 4.2.1. Key market trends

Applications involving radar systems have come a long way over the years. Radar sensors are a standard technique for tank level probing in various industrial applications. Therefore, radar sensor could become feasible as a replacement for expensive laser-interferometer based calibration devices in the future. For instance, in 2015, NXP acquired Freescale which gave it a strong portfolio of microcontrollers, especially for radar. This has strengthened NXP's foothold in the market for self-driving cars. Radar systems are also used to assist visually impaired individuals in navigation.

**FIGURE 15. RADAR SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION)**

Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

**FIGURE 16. MARKET REVENUE & FORECAST OF RADAR SENSOR MARKET, 2014–2022 (\$MILLION)**



*Source: Primary Research, Government Publications, Company Releases, and AMR Analysis*

#### **4.2.2. Growth factors and opportunities**

The major factors for the growth of radar sensor market are increasing benefits of radar sensors compared to other remote sensing technologies, increasing adoption of radar sensors for various applications, and comfort, safety & assistance features offered by the usage of radar sensors.

### 4.2.3. Market size and forecast

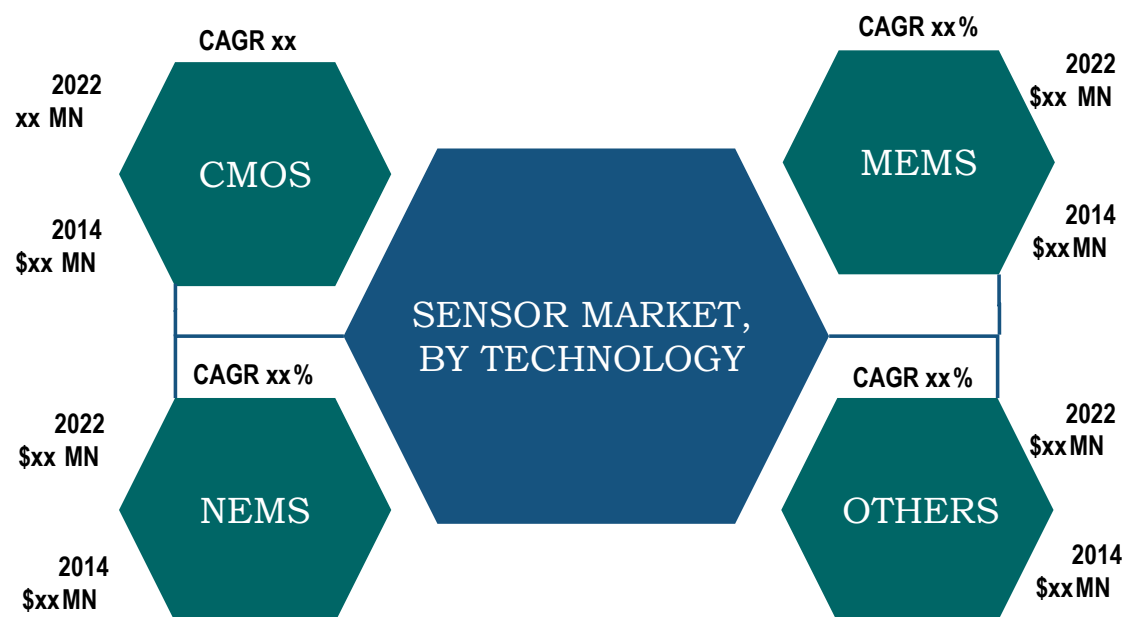
#### RADAR SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR% (2016–2022)
North America	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Europe	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Asia-Pacific	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
LAMEA	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Total	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

## CHAPTER 5 WORLD SENSOR MARKET, BY TECHNOLOGY

**FIGURE 41. WORLD SENSOR MARKET, BY TECHNOLOGY**



Source: AMR Analysis



## 5.1. OVERVIEW

The sensor market comprises of various technologies which include CMOS, MEMS, NEMS, and others (optical spectroscopy, microsystem technology, ASIC, and hybrid sensor). These sensor technologies are majorly used in distinct sensors, such as CMOS technology is used majorly in image sensors, MEMS technology based sensors comprise of pressure sensor, accelerometer, gyroscope, pressure sensor, and biosensor among others. NEMS is relatively new technology and it is used in relays, mass spectrometer, and healthcare related sensors among others.

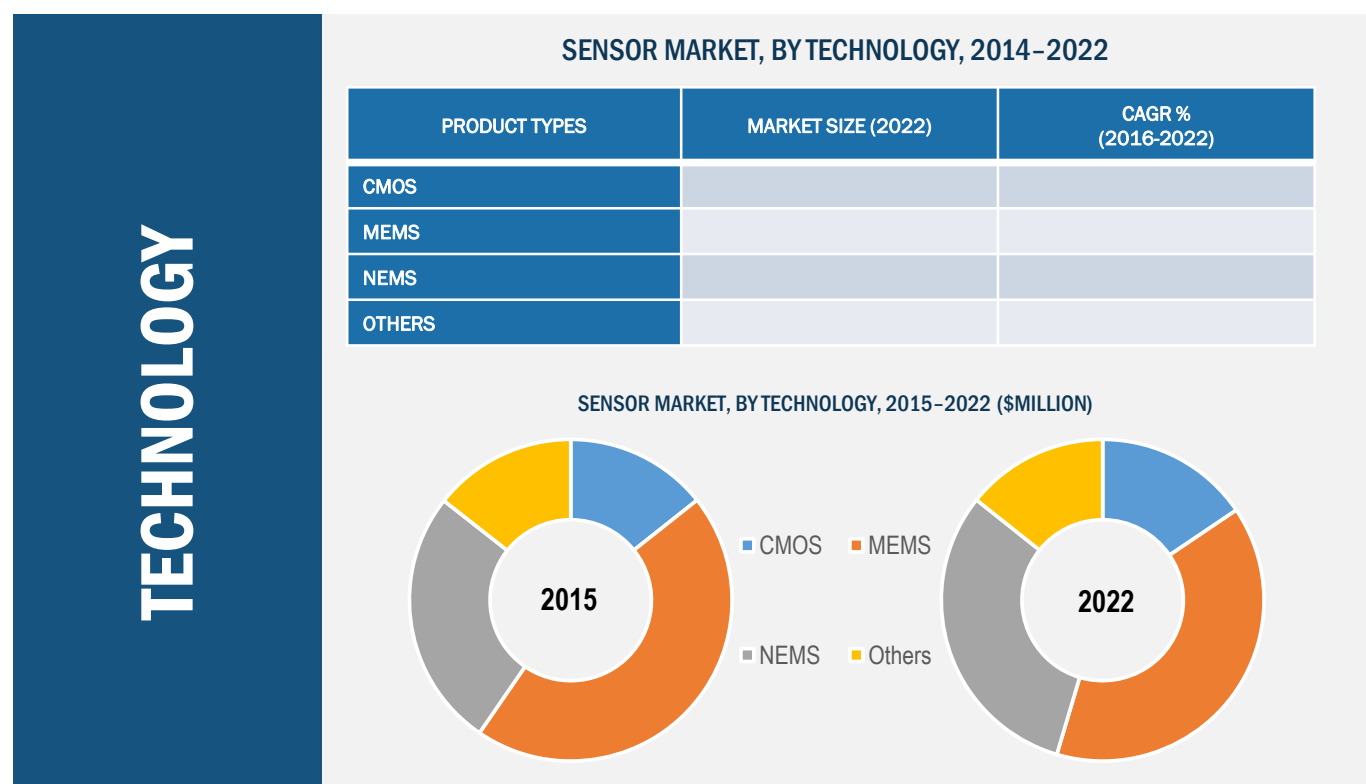
### 5.1.1. Market size and forecast

The world sensor market, by technology, is estimated to reach a market size of \$XX million by 2022, as compared to \$XX million in 2015, growing at a CAGR of XX% from 2016 to 2022.

**TABLE 17      SENSOR MARKET, BY TECHNOLOGY, 2014–2022 (\$MILLION)**

Technology	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR % (2016–2022)
CMOS	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
MEMS	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
NEMS	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Others	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Total	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

**FIGURE 42. WORLD SENSOR MARKET, BY TECHNOLOGY, REVENUE & CAGR**

Source: AMR Analysis

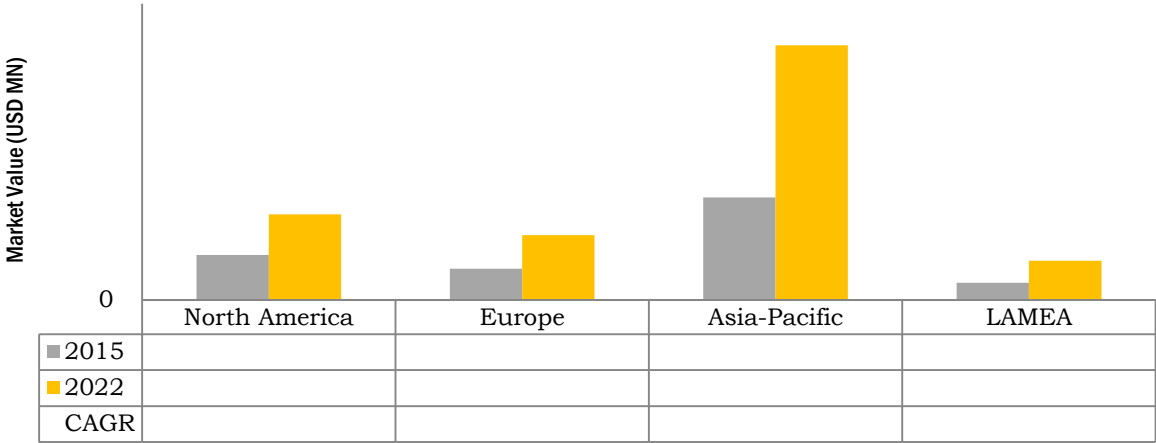
## 5.2. CMOS

The Complementary metal-oxide-semiconductor (CMOS) technology with active pixels is used in image sensors that are used in cameras, and widely used across various appliances such as smartphones, tablets, laptops, and low-end digital and surveillance cameras. Low cost, decent picture quality, and application in various devices such as mobile phones, tablets, and laptops among others are the factors driving the growth in the demand of CMOS sensor across the globe.

### 5.2.1. Key market trends

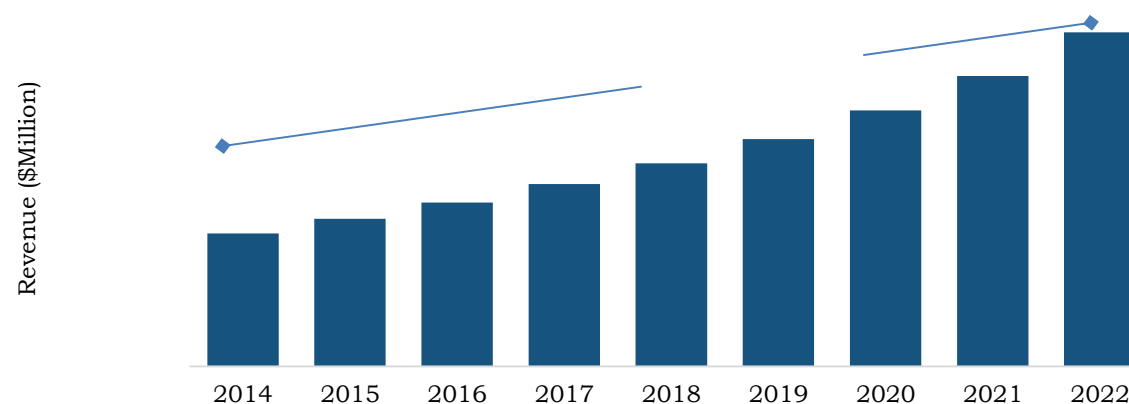
The CMOS technology holds almost three fourth of the whole image sensor market, however, in overall sensor market the CMOS technology shares the least share as it is majorly used in image sensor only. The major companies manufacturing image sensors, such as, Sony, Panasonic, Samsung, and Canon among others, invest heavily on research & development to keep ahead of the others in the market. For instance, in the year 2014, Sony has launched the world's highest sensitive CMOS image sensor for automotive cameras. Furthermore, Canon has launched an image sensor with global shutter mode of operation which creates pictures without any distortion.

**FIGURE 43. CMOS SENSOR MARKET ANALYSIS, 2015-2022 (\$MILLION)**



Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

**FIGURE 44. MARKET REVENUE & FORECAST OF CMOS SENSOR MARKET, 2014–2022 (\$MILLION)**



*Source: Primary Research, Government Publications, Company Releases, and AMR Analysis*

### 5.2.2. Growth factors and opportunities

The innovation in consumer electronics has increased the penetration of camera in daily life through smartphones, tablets, laptops, and personal computers among others. These low end cameras use CMOS image sensor as these sensors comparatively incur less cost and produce decent image quality. Growing industrialization has considerably increased the need of cameras for security and surveillance, most of which use CMOS image sensors owing to its easy availability and less price. The growing smartphone industry and growth in security and surveillance has opened new opportunities for CMOS image sensors and the market is anticipated to grow in years to come.

### 5.2.3. Market size and forecast

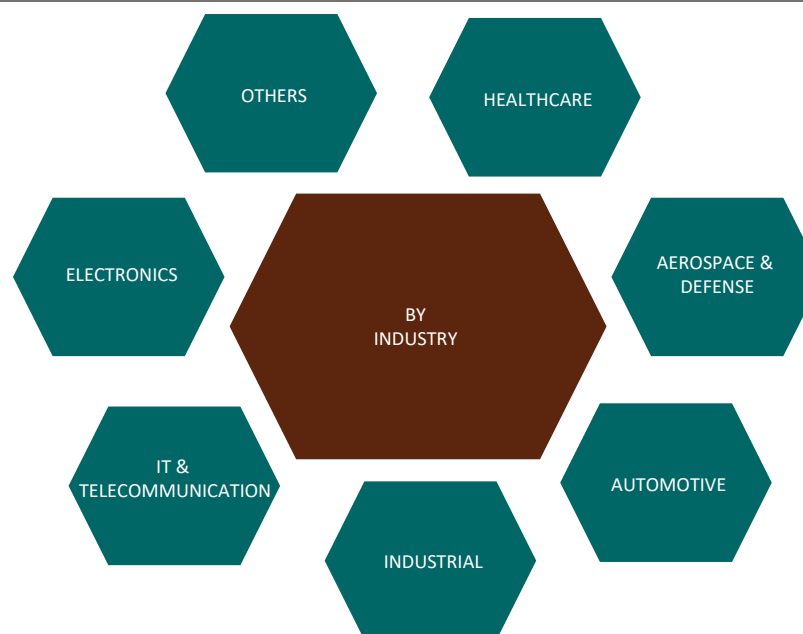
**TABLE 18 CMOS SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION)**

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR% (2016–2022)
North America	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Europe	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Asia-Pacific	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
LAMEA	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Total	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

*Source: Primary Research, Government Publications, Company Releases, and AMR Analysis*

## CHAPTER 6 WORLD SENSOR MARKET, BY INDUSTRY VERTICAL

**FIGURE 51. WORLD SENSOR MARKET, BY INDUSTRY VERTICAL**



*Source: Primary Research, Government Publications, Company Releases, and AMR Analysis*



## 6.1. OVERVIEW

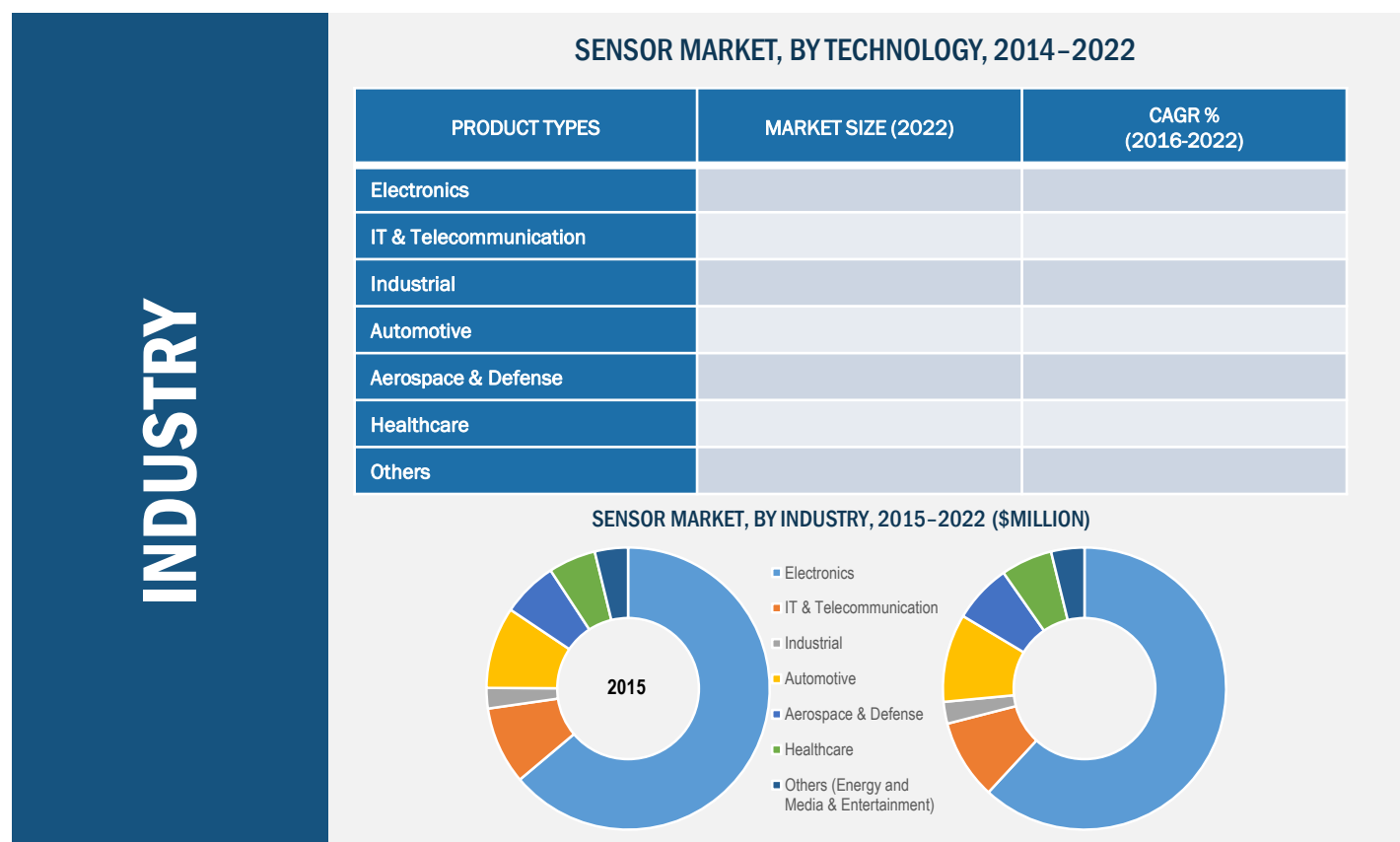
On the basis of industry verticals, sensor market is segmented into electronics, IT & telecommunication, Industrial, Automotive, Aerospace & Defense healthcare, and others (Energy and Media & Entertainment). The electronics segment dominates the overall sensor market by claiming about two third part of the overall market share as it includes devices such as smartphones, laptops, digital cameras, T.V. sets, and digital recorders among others which incorporate a wide range of sensors like accelerometer, gyroscope, image sensor, pressure sensor, fingerprint scanner, and touch sensor among others for their operation. The sensors are used in other industry verticals such as industrial sector, aerospace & defense, and others for enabling automation.

### 6.1.1. Market size and forecast

**TABLE 22      SENSOR MARKET, BY INDUSTRY VERTICAL, 2014–2022 (\$MILLION)**

Industry Vertical	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR% (2016–2022)
Electronics	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
IT & Telecommunication	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Industrial	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Automotive	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Aerospace & Defense	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Healthcare	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Others	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Total	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

**FIGURE 52. WORLD SENSOR MARKET, BY INDUSTRY VERTICAL, REVENUE & CAGR**

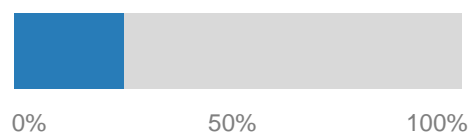
Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

## CHAPTER 7 WORLD SENSOR MARKET, BY GEOGRAPHY

**FIGURE 67. WORLD SENSOR MARKET, BY GEOGRAPHY**

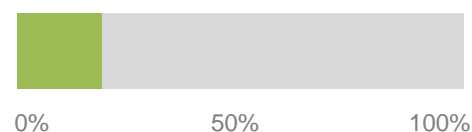
### North America

XX%



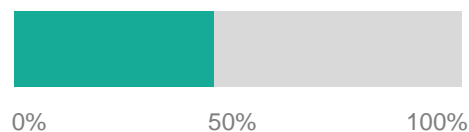
### Europe

XX%



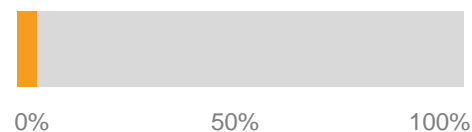
### Asia-Pacific

XX%



### LAMEA

XX%



Source: AMR Analysis

## 7.1. OVERVIEW

The geographical analysis of world sensor market covers North America, Europe, Asia-Pacific, and LAMEA. North American region includes U.S., Canada, and Mexico. Europe is segmented into Germany, UK, France, Italy, and Rest of Europe which includes the remaining European countries. Asia-Pacific includes China, India, Japan, South Korea, Taiwan, and Rest of Asia-Pacific. LAMEA region includes Latin America, Middle East, and Africa.

The sensor market is diversified and has global presence based on sensor production and supply. Asia-Pacific leads the market of sensor technology throughout the analysis period followed by North America and Europe. This trend is prevailing, owing to the expanding electronics industry and investment by companies on research development to fulfill the need of automated systems.

**TABLE 30      SENSOR MARKET, BY REGION, 2014–2022 (\$MILLION)**

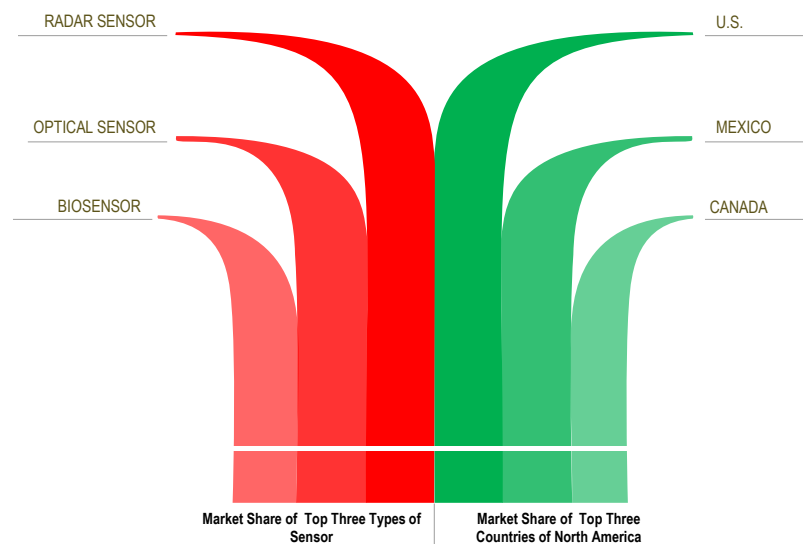
Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR% (2016–2022)
North America	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Europe	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Asia-Pacific	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
LAMEA	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Total	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

## 7.2. NORTH AMERICA

North America has emerged as the second largest region in world sensor market however; the growth in world sensor market in North America region is expected to be the slowest as compared to the other parts of the world. The reason behind sluggish growth rate is that most of the companies of the region have located their production facilities outside the region mostly in countries such as China, South Korea, and Japan among others, owing to reduced costs and availability of cheap labor along with raw materials.

**FIGURE 68. NORTH AMERICA SENSOR MARKET**



Source: Primary Research, AMR Analysis

## 7.2.1. Key market trends

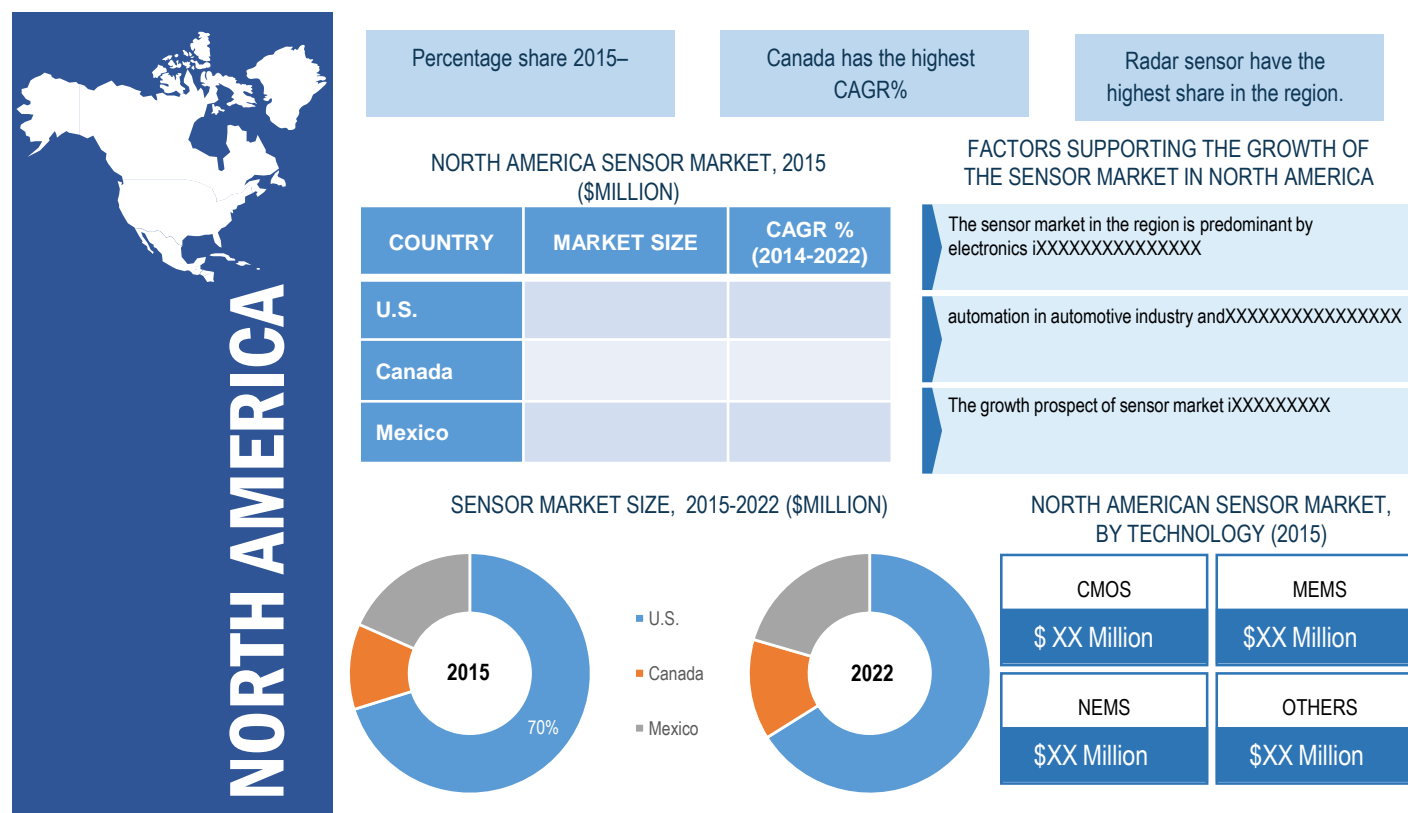
Consumer electronics dominate the sensor market in overall North America region. Rising demand of smartphones and other electronics products, ongoing research and development regarding driverless cars by major American companies such as Google & Tesla, and growing aviation industry drives the need of sensors such as image sensor, radar sensor, touch sensors, and optical sensors are gaining a grip in the market over other type of sensors. The MEMS technology based sensors which include gyroscope, accelerometer, speed sensor, pressure sensor, and proximity sensor among others have more implementation than other technologies as these are highly used in electronics and aerospace & defense, two industries which constitute more than two third of the overall North American sensor market. The market is anticipated to witness a slow paced growth as compared to all the four regions owing to a comparatively saturated electronics market in comparison to Asia-Pacific and Europe.

## 7.2.2. Growth factors and opportunities

The sensor market in the region is predominant by electronics industry, which is followed by IT & telecom, industrial, and automotive sector. The growth prospect of sensor market in the region is majorly propelled by the increasing number of electronic devices which incorporate a major share of overall sensors used in the region. Automation in automotive industry and growing trend of driverless cars is yet another reason behind the growth of sensor market as the sensors such as proximity sensor, image sensor, and displacement sensor among others are an integral part of any driverless cars. The investments by leading players operating in the region are anticipated to drive the growth of sensor market in the North America.

### 7.2.3. Market size and forecast

**FIGURE 69. NORTH AMERICA SENSOR MARKET, REVENUE & CAGR, 2015-2022**



Source: Primary Research, AMR Analysis



**TABLE 31 NORTH AMERICA: SENSOR MARKET, BY TYPE, 2014–2022 (\$MILLION)**

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR% (2016–2022)
Radar sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Optical sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Biosensors	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Touch sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Image sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Pressure sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Temperature sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Proximity sensor and displacement sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Level sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Motion and position sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Humidity sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Accelerometer and speed sensor	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Others	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Total	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

**TABLE 32 NORTH AMERICA: SENSOR MARKET, BY TECHNOLOGY, 2014–2022 (\$MILLION)**

Technology	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR% (2016–2022)
CMOS	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
MEMS	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
NEMS	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Others	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Total	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

**TABLE 33 NORTH AMERICA: SENSOR MARKET, BY INDUSTRY VERTICAL, 2014–2022 (\$MILLION)**

Industry Vertical	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR% (2016–2022)
Electronics	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
IT & Telecommunication	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Industrial	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Automotive	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Aerospace & Defense	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Healthcare	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Others	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Total	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

**TABLE 34 NORTH AMERICA: SENSOR MARKET, BY COUNTRY, 2014–2022 (\$MILLION)**

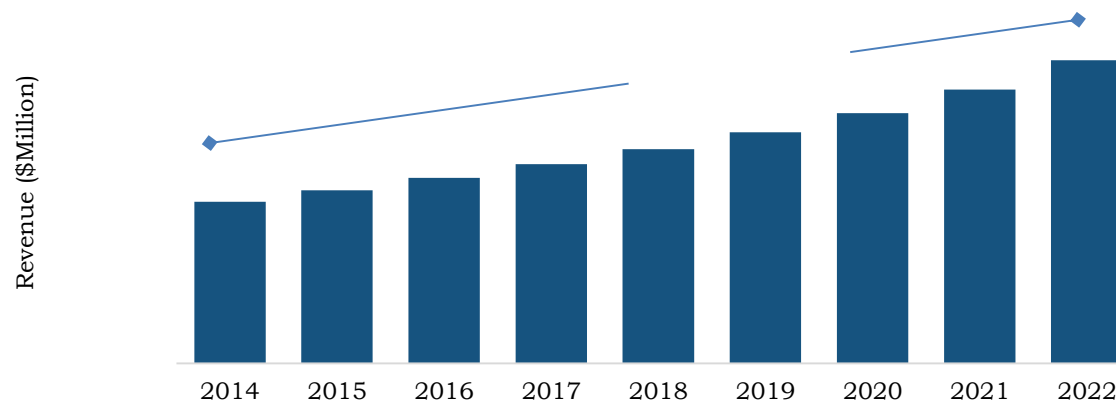
Country	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR% (2016–2022)
U.S.	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Canada	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Mexico	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Total	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Source: Primary Research, Government Publications, Company Releases, and AMR Analysis

## 7.2.4. U.S.

### 7.2.4.1. Market size and forecast

**FIGURE 70. U.S.: SENSOR MARKET SIZE, 2014-2022 (\$MILLION)**



Source: Primary Research, Government Publications, and AMR Analysis

# DISCLAIMER

In response to request/orders received, Allied Market Research (AMR) provides strategic business/market analysis services to a select group of customers that are limited to publications containing valuable market information. The publication is solely for our customers' internal use. It is acknowledged by our customer, by placing the order that no part of this strategic business/market analysis service is for general publication or disclosure to third party.

AMR doesn't make any warranty for the accuracy of the data as these are primarily based on interviews and therefore, liable for fluctuation. Also, AMR doesn't take responsibility for incorrect information supplied by manufacturers or users.

Any resale, lending, disclosure or reproduction of this publication can only be made with prior written permission from AMR.

Transmission and/or reproduction of this document by any means or in any form (includes photocopying, mechanical, electronic, recording or otherwise) are prohibited without permission of AMR.

**For information regarding permissions, contact:**

**Tel: +1 (503 894-6022)**

**Email: [sales@alliedmarketresearch.com](mailto:sales@alliedmarketresearch.com)**