Environmental Gas Sensors 2017-2027

Description: Over 90% of the world's population live in areas that exceed World Health Organization limits on air pollution. Air pollution in the United States costs more than $200 billion annually in lost work days and hospital costs and could develop into a health and climate crisis reminiscent of those seen in China and India, a study by a global policy forum has found. The growing awareness of air pollution will be driving the demand for gas sensors.

Gas sensors have traditionally been limited to industrial leak detection and household carbon monoxide alarms, but a new wave of miniaturization and cost reduction in the chemical gas sensor industry has enabled a new environmental monitoring ecosystem, which analysts estimate will be worth $361 million in 2017, $2.4 billion in 2022 and over $3 billion in 2027.

Gas sensors offer many advantages over traditional reference equipment and environmental modelling techniques, in addition to direct measurement of a pollutant, sensors are far more mobile, enabling greater spatial coverage of an area, the low cost, high robustness, simple interface electronics and ease of production of these sensors make them ideal candidates for commercial environmental monitoring.

New manufacturing methods, able to produce low power, miniaturized sensors mean that large growth is expected in the portable sensor field, with sensors becoming integral components in mobile devices and wearable technology.

This report covers the broad range of technologies that make up the gas sensor ecosystem. The report takes a historical look at gas sensing and assesses the new wave of miniaturization, predicting the impact it will have on consumer electronics and the future of smart cities. All the key players are profiled and the market is analysed by application and by sensing technology.

The report contains analysis and forecasts across six market segments, these are:

- Mobile Devices - Covering cell phones, tablets and cases for such devices
- Wearables - Covering smart watches, fitbands, wearable monitors, bags and jewellery.
- Indoor Air Quality - Covering indoor air quality monitors, HVAC systems, smart windows and the integration of such devices into a single IoT ecosystem.
- Air Purifiers - Detailing the growing air purifier market.
- Automotive - Covering air quality monitors in automobiles to control HVAC systems and measure air quality inside and outside a vehicle.
- Smart City - Covering a full array of smart city programs, including fixed and mobile networks public and crowdsourced databases and deployment of sensors onto automobiles, bikes, drones, buses, trains and lamp posts.

The report contains 10 year forecasts across all six market segments, detailing revenues and volumes across multiple sensing technologies.

The author has built a comprehensive picture of environmental gas sensors. The report contains company profiles of the largest, most innovative and disruptive companies in the industry. All profiles are generated from interview-based primary research with key staff from the relevant company, and are compiled alongside our other research to give maximum insight into the industry. In our end user interviews, we outline the future direction in some of the world's largest companies, outlining their vision for how sensors will play a key role in the future of pollutant monitoring, and what they feel is needed from parallel industries to drive further growth.

Contents: 1. EXECUTIVE SUMMARY
1.1. New technology is unlocking the market
1.2. Six major market segments
1.3. Key players in each sensor type
1.4. Trends by market segment
1.5. Trends by detection principles

2. INTRODUCTION
2.1. The global challenge of air pollution
2.2. Effects of outdoor air pollution
2.3. Indoor Air Pollution is also an issue
2.4. The Seven Most Common Atmospheric Pollutants
2.5. International Air Quality Standards
2.6. Need For Environmental Monitoring
2.7. Types of Environmental Sampling
2.8. Potential Uses For Low Cost Air Quality Monitors

3. TECHNOLOGIES FOR POLLUTION SENSING
3.1. Current Pollution Monitoring Instruments Are Costly
3.2. Gas sensors offer an alternative
3.3. Sensor Industry
3.4. History Of Chemical Sensors
3.5. Concentrations Of Detectable Atmospheric Pollutants
3.6. Environmental Sensing In Industrial Facilities
3.7. Five Common Detection Principles for Sensors
3.8. Introduction To Pellistor Gas Sensors
3.9. Introduction To Infrared Gas Sensors
3.10. Introduction To Metal Oxide (MOS) Gas Sensors
3.11. Introduction To Electrochemical Gas Sensors
3.12. Introduction To Optical Particle Detection
3.13. Transition To New Manufacturing Methods
3.15. Current Research In Gas Sensors: Zeolites
3.16. Energy Harvesting Technologies For Gas Sensors
3.17. Sensors In Comparison With Traditional Monitoring Equipment

4. MINIATURIZATION OF GAS SENSORS
4.1. Miniaturized Sensors: A Tipping Point In The Market
4.2. Sensor Fabrication Using MEMS manufacturing
4.3. Flat Electrochemical Sensors
4.4. Comparison Between Classic And Miniaturised Sensors
4.5. Miniaturisation Of Pellistor Gas Sensors
4.6. Miniaturisation Of Infrared Gas Sensor
4.7. Miniaturisation Of Electrochemical Gas Sensors
4.8. Miniaturisation Of MOS Gas Sensors
4.9. Comparison Of Miniaturised Sensor Technology

5. COMPETITIVE ANALYSIS OF THE ENVIRONMENTAL SENSOR MARKET
5.1. The Gas Sensor Value Chain
5.2. List Of Gas Sensor Manufacturers
5.3. Recent Acquisitions In The Gas Sensor Industry
5.4. Sensor Manufacturer Business Models
5.5. Porters' Five Force Analysis Of Industry
5.6. SWOT analysis of 10 manufacturers
5.7. Future Challenges For Sensor Manufacturers

6. SENSORS IN MOBILE DEVICES
6.1. The Mobile Device Industry
6.2. Suitable Detection Principles For Mobile Devices
6.3. Challenges For Sensor Integration Into Smartphones
6.4. Future Market Opportunities In The Mobile Device Sector

7. SENSORS IN WEARABLES
7.1. The Wearable Technology Industry
7.2. Sensor Integration In Wrist Wear
7.3. Technology Requirements Of Wearable Sensors
7.4. Wearable Sensors As Part Of Modular Wrist Straps
7.5. Environmental Sensor Integration In Fashion Accessories
13.20. Other application, by Revenue
13.21. Conclusions

14. COMPANY PROFILES

Ordering: Order Online - http://www.researchandmarkets.com/reports/3987739/
Order by Fax - using the form below
Order by Post - print the order form below and send to

Research and Markets,
Guinness Centre,
Taylors Lane,
Dublin 8,
Ireland.
Fax Order Form
To place an order via fax simply print this form, fill in the information below and fax the completed form to 646-607-1907 (from USA) or +353-1-481-1716 (from Rest of World). If you have any questions please visit http://www.researchandmarkets.com/contact/

Order Information
Please verify that the product information is correct and select the format(s) you require.

Product Name: Environmental Gas Sensors 2017-2027  
Web Address: http://www.researchandmarkets.com/reports/3987739/  
Office Code: SC2GUTV1

Product Formats
Please select the product formats and quantity you require:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Electronic (PDF) - 1 - 5 Users</td>
<td>USD 4987</td>
</tr>
<tr>
<td></td>
<td>Electronic and Hard Copy (PDF) - 1 - 5 Users</td>
<td>USD 5288 + USD 56 Shipping/Handling</td>
</tr>
<tr>
<td></td>
<td>Electronic (PDF) - 1 - 10 Users</td>
<td>USD 7484</td>
</tr>
<tr>
<td></td>
<td>Electronic and Hard Copy (PDF) - 1 - 10 Users</td>
<td>USD 7785 + USD 56 Shipping/Handling</td>
</tr>
</tbody>
</table>

* Shipping/Handling is only charged once per order.

* The price quoted above is only valid for 30 days. Please submit your order within that time frame to avail of this price as all prices are subject to change.

Contact Information
Please enter all the information below in BLOCK CAPITALS

Title:  
First Name: ___________________________  
Last Name: ___________________________  
Email Address: * ___________________________  
Job Title: ___________________________  
Organisation: ___________________________  
Address: ___________________________  
City: ___________________________  
Postal / Zip Code: ___________________________  
Country: ___________________________  
Phone Number: ___________________________  
Fax Number: ___________________________  

* Please refrain from using free email accounts when ordering (e.g. Yahoo, Hotmail, AOL)
Payment Information

Please indicate the payment method you would like to use by selecting the appropriate box.

☐ Pay by credit card: You will receive an email with a link to a secure webpage to enter your credit card details.

☐ Pay by check: Please post the check, accompanied by this form, to:

Research and Markets,
Guinness Center,
Taylors Lane,
Dublin 8,
Ireland.

☐ Pay by wire transfer: Please transfer funds to:

Account number 833 130 83
Sort code 98-53-30
Swift code ULSBIE2D
IBAN number IE78ULSB98533083313083
Bank Address Ulster Bank,
27-35 Main Street,
Blackrock,
Co. Dublin,
Ireland.

If you have a Marketing Code please enter it below:

Marketing Code: ____________________________

Please note that by ordering from Research and Markets you are agreeing to our Terms and Conditions at http://www.researchandmarkets.com/info/terms.asp