



ARIZONA ENVIRONMENTAL STRATEGIC ALLIANCE

WELCOME TO INTEL

*Craig McCurry, P.E.
Senior Environmental Engineer*

Agenda

- Intel Commitment to Sustainability
- Approach to Sustainability
- Product Stewardship
- Intel is Evolving
- Company Sustainability Metrics and Goals
- Intel in Arizona
- Questions?
- Tour of OBRF

Intel and Drone Technology – Breaking New Ground

Drone Encore

Intel's EHS Policy

Environmental, Health and Safety Policy

Intel is committed to caring for our people and the planet by integrating design for the environment and safety principles into all aspects of our business; from the development of our products, through our supply chain and manufacturing. We believe that responsible environmental stewardship is good business and that our technology can play a key role in addressing the planet's sustainability challenges.

We will comply with all applicable regulatory and Intel Environmental Health & Safety (EHS) requirements wherever we operate. We will engage with stakeholders to develop responsible laws, regulations and innovative programs that provide safeguards for the community, the workplace, and the environment while providing flexibility to meet the needs of our business.

We are committed to provide a safe, injury-free workplace by integrating safety into our daily business decisions and processes. Management leads the effort behind this important Intel value, and all employees are responsible for both their safety and the safety of those around them. We actively promote a healthy lifestyle and encourage employees to proactively manage their personal health.

We strive to conserve natural resources through innovative processes and continuous improvement methodologies with the goal of reducing, reusing, recycling, and identifying safer material substitutes or alternatives for our operations. We strive to utilize green chemistry principles to identify safer material substitutes or alternatives for our operations. We will continue to invest in energy conservation, we will work to reduce our emissions over time and adhere to our climate change policy and water policy.

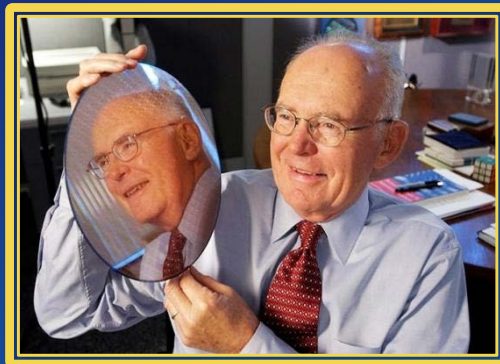


EXECUTING TO MOORE'S LAW

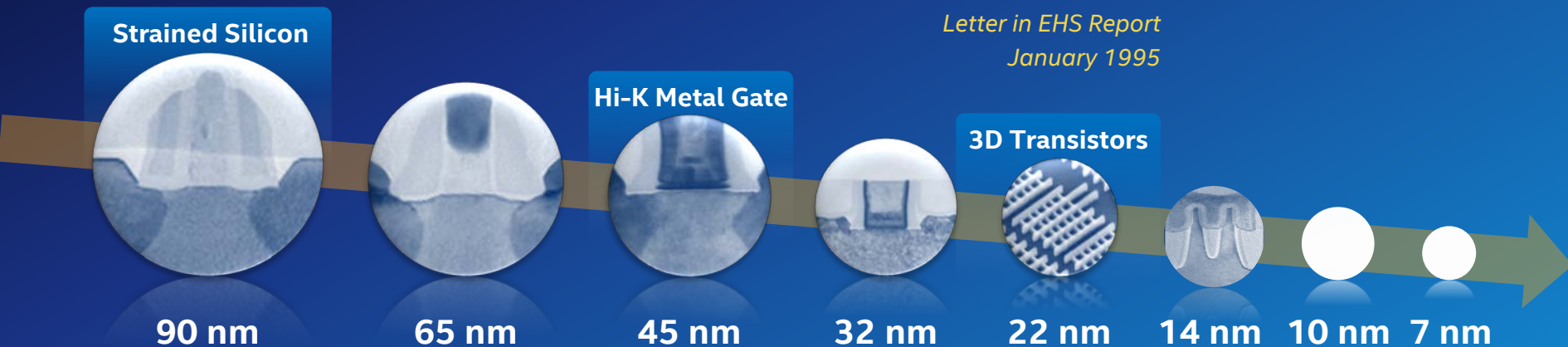
Enabling new devices with higher functionality and complexity while controlling power, cost, and size

"We need to continually improve our manufacturing process, thereby reducing our burden on the environment and becoming an asset to the communities in which we live and work."

Gordon Moore, Intel Chairman



*Letter in EHS Report
January 1995*



LINKING TECHNOLOGY AND SUSTAINABILITY

What If You Applied Moore's Law To The Automobile...

1971 – 81 MPH
Today – 324,000 MPH

Speed Increase

1971 – 26 MPG
Today – 130,000 MPG

Energy Efficiency

1971 – \$2,500.00

Today – \$0.05

\$230
Cost



INTEL'S APPROACH TO SUSTAINABILITY

Our mission for the coming decade

- *Pursuing a gentler footprint*
- *Innovation for the planet*
- *Engaging for a sustainable future*



GREEN: PURSUING A SMALLER FOOTPRINT

Focus Areas:

- *Energy conservation*
- *Renewables*
- *Water conservation*
- *Greener buildings*
- *Empowering employees*
- *Transparency*



RENEWABLES

- *Newest solar installation in Folsom, California is the largest private solar carport in the U.S.— more than half of the site's peak energy supply is now solar.*
- *Investing in fuel cell, wind and solar technologies*



ENVIRONMENTAL SUSTAINABILITY

Key issues: Climate change and energy use, water conservation, green buildings, and waste management

- For the eighth consecutive year, Intel is the U.S.'s largest voluntary corporate purchaser of green power, according to the U.S. Environmental Protection Agency.
- Since 2008, we have also conserved more than 52 billion gallons of water and return close to 80% of our water withdrawals back to municipal water treatment operations, where it can be treated for reuse

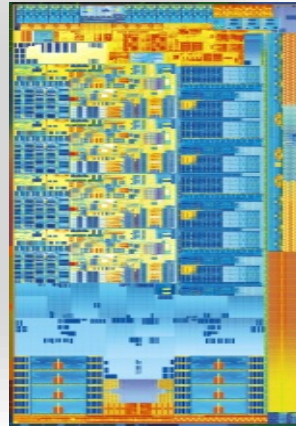


OUR APPROACH TO SUSTAINABILITY

*Care for our people, the planet and
inspire the next generation*



Operations



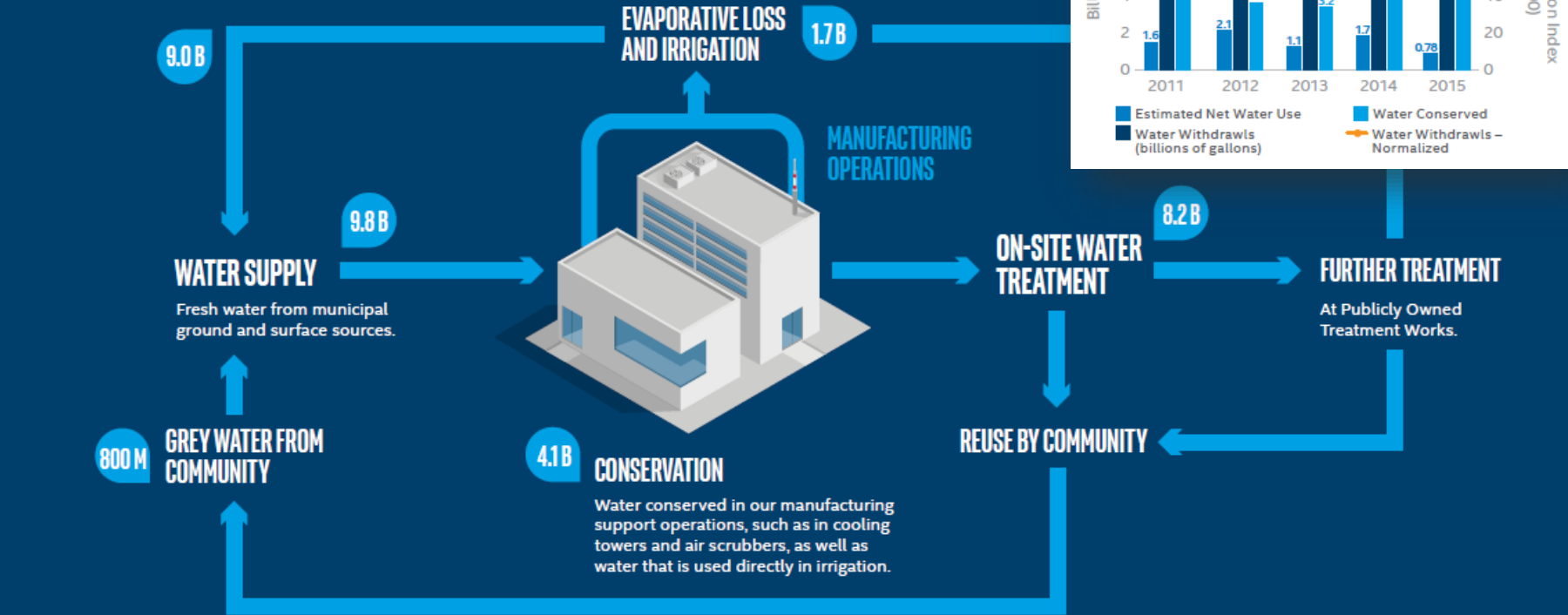
Products &
Technologies



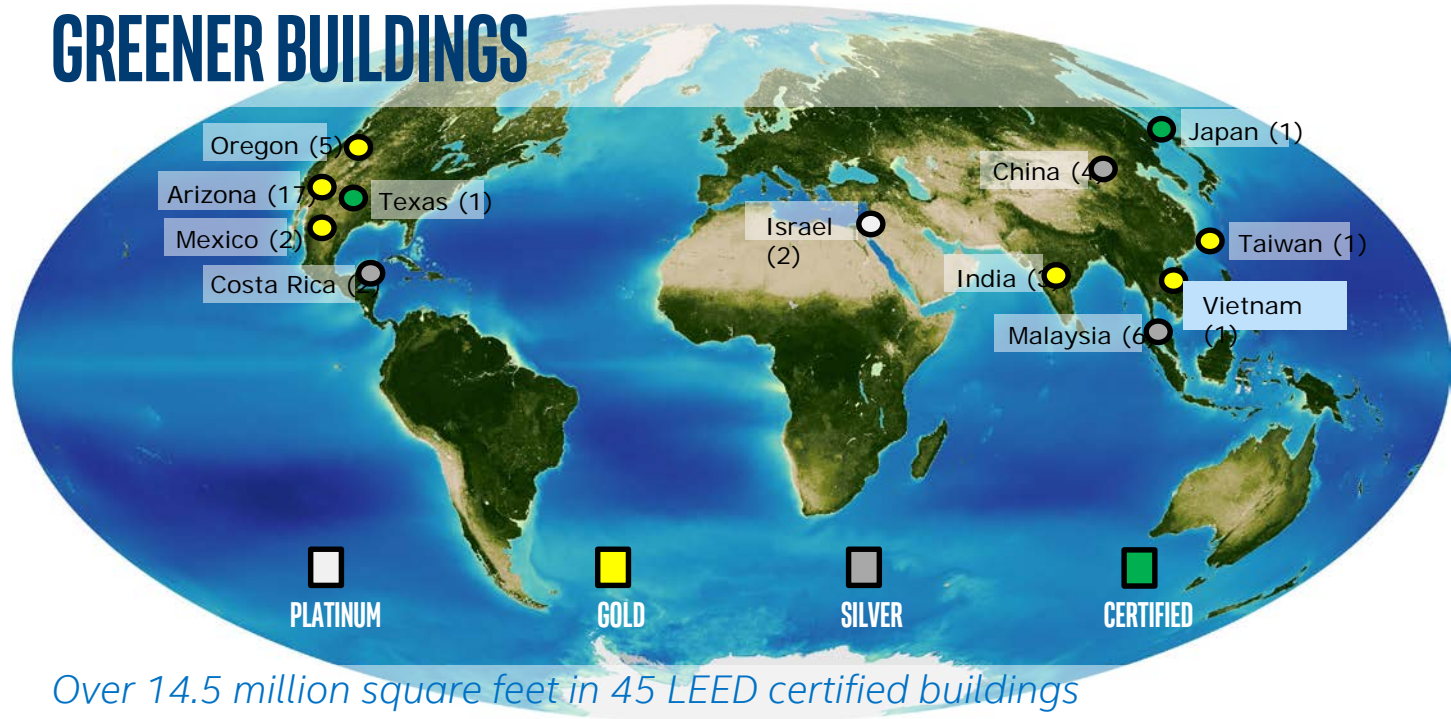
People

RESPONSIBLE WATER MANAGEMENT

Intel's Operational Water Footprint (in gallons)



GREENER BUILDINGS



EMPOWERING EMPLOYEES & THE COMMUNITY



Learn

Employee Bonus
tied to
sustainability goals



Act

“Sustainability
In Action”
grant program



Share

Explore Intel for
community

PFA (PERFLUOROALKOXY) CIRCULAR ECONOMY

Current Situation:

- PFA which is a fluoropolymer which is chemically inert and solvent resistant to virtually all chemicals
- It is not recyclable and when sent to recyclers ends up in landfills



Solution:

- Recycle PFA back into PFA

De-installs:

- Have the trades take all clear plastic pipes to one location onsite
- Send this back to the manufacturer



Installs:

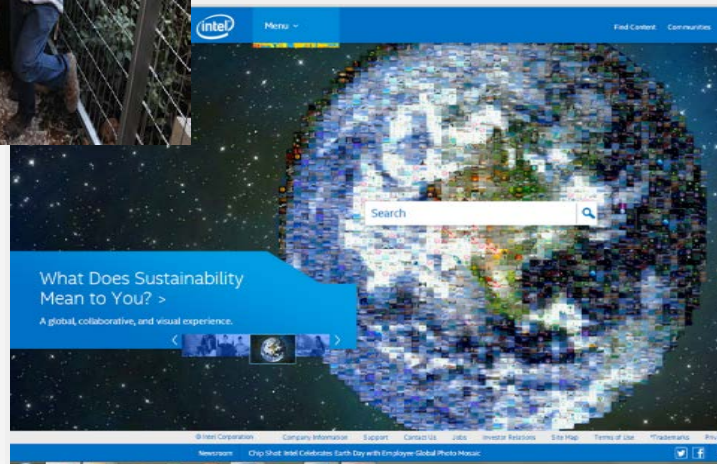
- Scraps/Excess go to a single bin and send back to the Manufacturer



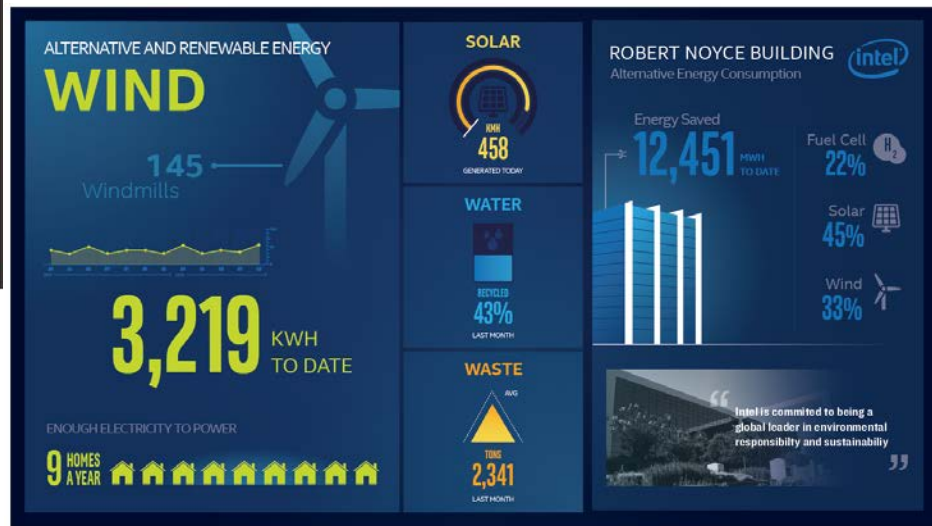
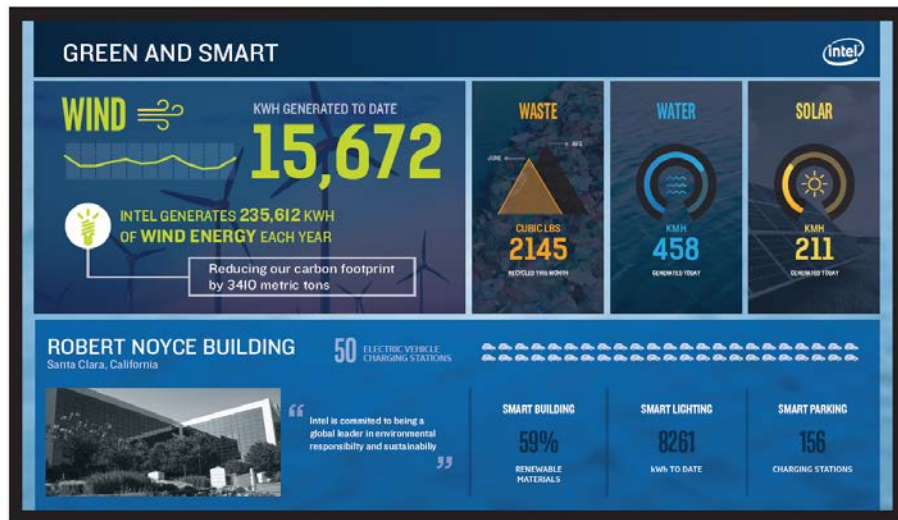
SUSTAINABILITY IN ACTION – IT'S THE PEOPLE



Since 2006:
75 projects
1000+ employees
10000+ impacts



ENGAGING OUR EMPLOYEES



OPERATIONS - BOTTOM LINE SAVINGS



There is a ROI for your business – have you found it?

SUSTAINABILITY IS GOOD BUSINESS

40+ LEED certified buildings

*World's largest
rooftop array of wind micro-turbines and
private solar carport*

\$120

*Million invested in
2,300+ energy
conservation
projects*

\$200+

*Million saved
through
energy
initiatives*



SUPPLY CHAIN RESPONSIBILITY

Key issues: Conflict-free and driving supplier accountability, diversity, and environmental impact

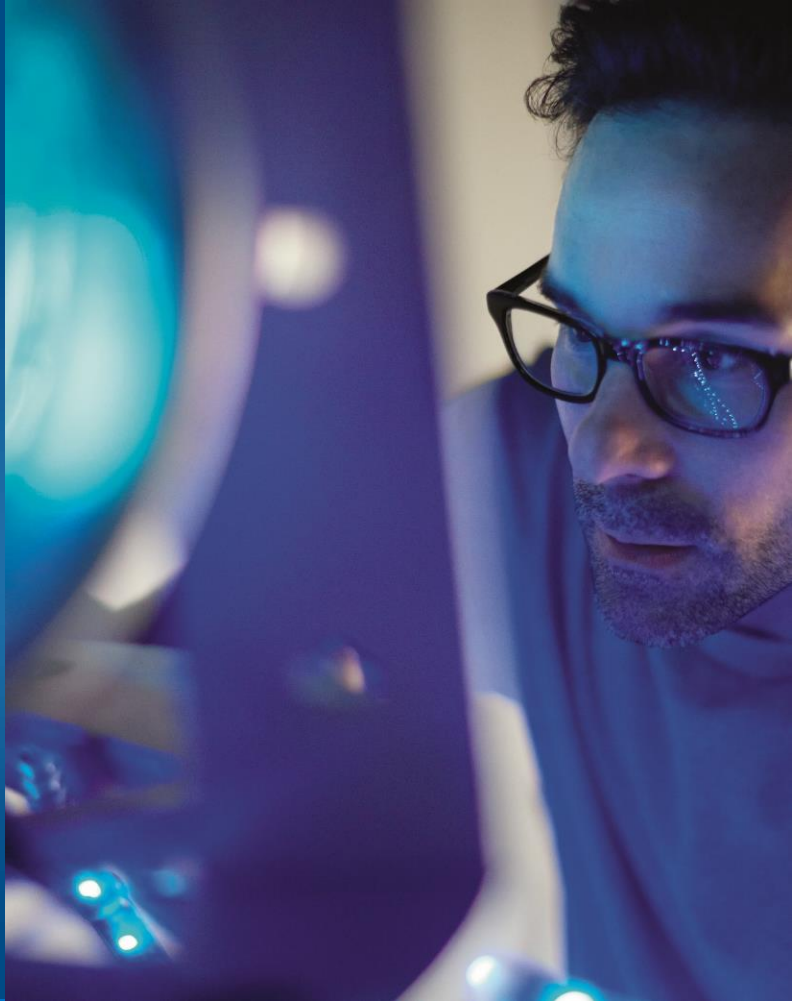
- Since 2013, Intel has manufactured microprocessors that are conflict-free for tantalum, tin, tungsten and gold. Intel is on track to achieve its goal to validate that its broader product base is conflict-free in 2016.
- Intel has committed to invest \$1 billion in annual spending by 2020 with diverse-owned businesses across the supply chain. In 2015, the company spent \$299 million with diverse suppliers, double the level in 2014.



PRODUCT STEWARDSHIP

Key issues: product ecology, energy efficiency, privacy and cybersecurity, and applying technology to solve social challenges

- Launched our 7th Gen Intel® Core™ processors which set a new standard for energy efficiency, offering up two-and-a-half times the performance and triple the battery life¹ when compared to computers many people currently own
- Intel, NetHope, and the United Nations Foundation developed a playbook that details how technology can be used as a tool to help achieve the UN Sustainable Development Goals

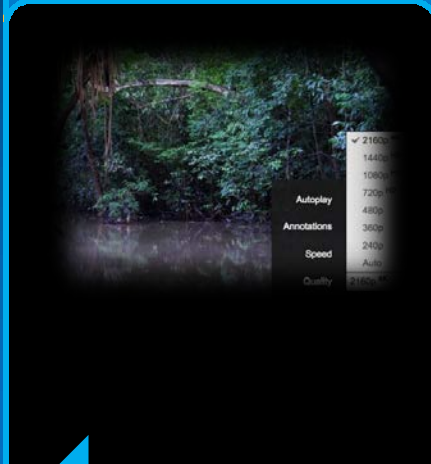


7TH GENERATION INTEL® CORE™ PROCESSOR

IMMERSIVE LIFE

STUNNING • SENSORY • ACTIVE • ENGAGING

4K UHD



360° VIDEO



VR/MR



ESPORTS



TRANSFORMING THE PC EXPERIENCE

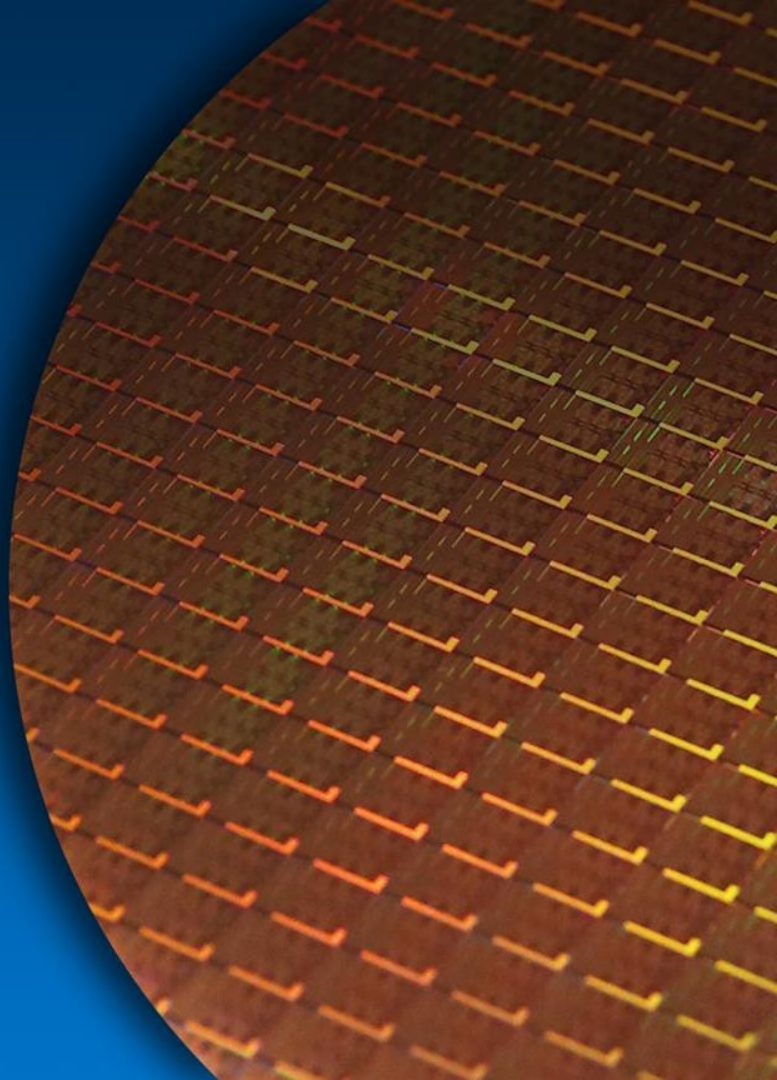
ARCHITECTURE & 14NM+ FUELS PERFORMANCE GAINS

Improved fin profile

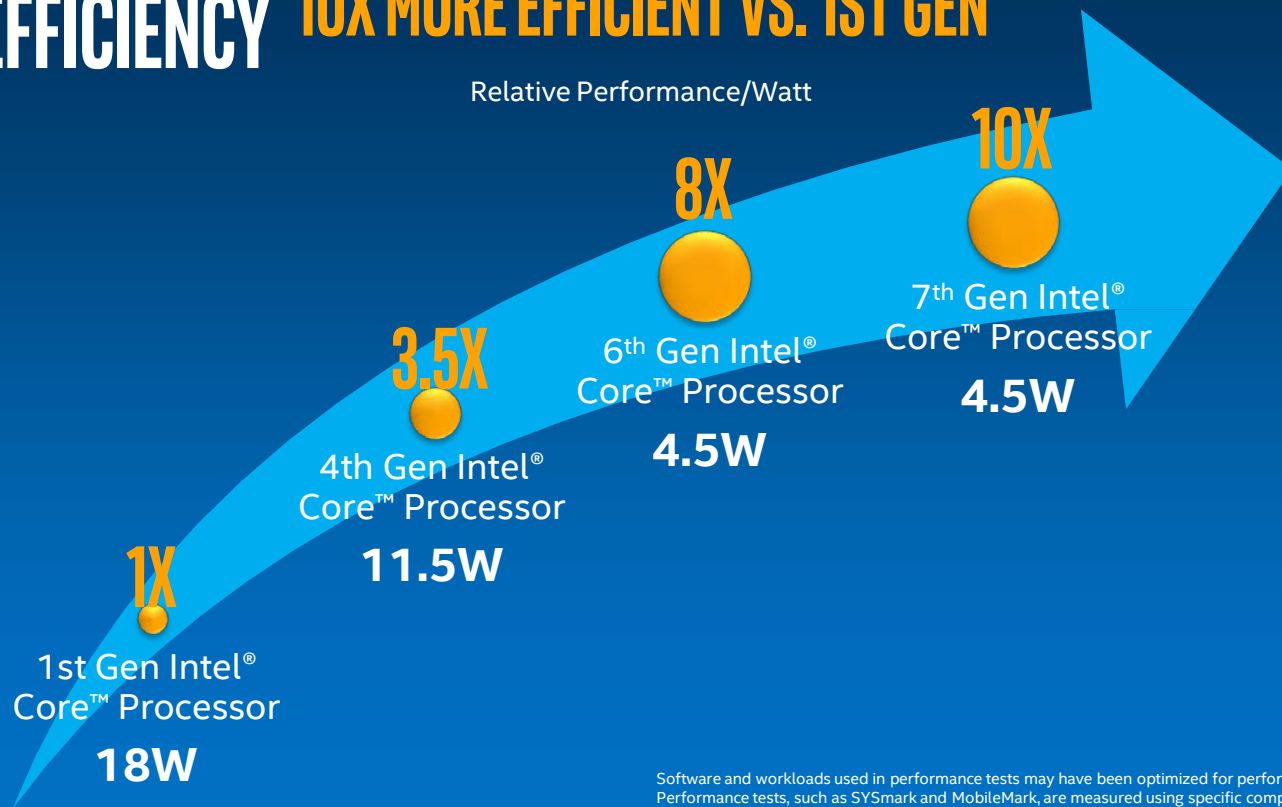
Improved transistor channel strain

Integrated design & manufacturing

**12% PROCESS PERFORMANCE INCREASE
SUPPORTS LEADING EDGE PROCESSORS**



DRIVING PERFORMANCE & POWER EFFICIENCY **10X MORE EFFICIENT VS. 1ST GEN**



*Performance based on SYSMark 2014-Overall Performance @ Native Resolution
See appendix for configurations

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information about performance and benchmark results, visit <http://www.intel.com/benchmarks>

7TH GEN INTEL® CORE™ PROCESSORS WORK FASTER FOR YOU

MORE THAN 70%¹ FASTER MOBILE PRODUCTIVITY THAN A 5 YEAR OLD PC

WORK

Get work done **faster**

1.7X FASTER¹

CREATE

Seamlessly create, edit and share 4K UHD 360 videos

8.6X FASTER²

GAME

Play your favorite games, like Overwatch*, on-the-go, in HD

3X BETTER³

LEAPS IN PERFORMANCE COMPARED TO 5-YR-OLD PC

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¹Based on SYSmark* 2014 Overall Score (Intel® Core™ i5-7200U vs. Intel® Core™ i5-2467M).
²Based on 4K 360 Video Creation Workload (Intel® Core™ i5-7200U vs. Intel® Core™ i5-2467M).
³Based on 3DMark* Cloud Gate Graphics Score (Intel® Core™ i5-7200U vs. Intel® Core™ i5-2467M).
See appendix for configurations

ENJOY 4K UHD LONGER

New VP9 & HEVC 10-bit Decode Capability Delivers Efficient & Fluid Playback

ANYWHERE

6TH GEN CORE

Up to 1080p
video streaming

Premium content
(HEVC 10-bit)



7TH GEN CORE

Up to 4K UHD video streaming
"All Day 4K" battery life (9.5hr)¹

4 hours video
battery life²

4K, 4K 360 YouTube* video
(VP9)



1.75X longer video
battery life (7hr)²

View multiple video streams
simultaneously, up to 4K

Multi-video streaming



Support for additional formats
of 4K 360 content streams

YOUR OWN 4K UHD THEATER ON THE GO

¹Based on 4K 10bit HEVC Local Video Playback on Intel® Core™ i7-7500U

vs. Intel® Core™ i7-6500U @ 66Whr battery and 4K panel

² As measured by 4K VP9 Streaming workload

*Other names and brands may be claimed as the property of others

See appendix for configurations

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7TH GEN INTEL® CORE™ PROCESSORS



PERFORMANCE LEADERSHIP

Work, multitask, create

1.7X – 15X¹ faster



BRINGING 4K UHD MAINSTREAM

"All Day 4K" battery life
(9.5hr)²

Premium 4K UHD content
on your PC



FEATURE RICH

120+ Thunderbolt™ 3
100+ Windows® Hello 4K
50+ 4K UHD
25+ Pen designs



INNOVATIVE DESIGNS

New levels of thin 2 in 1s
and clamshells

>100 DESIGNS IN Q4'16 STARTING IN SEPTEMBER

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¹Range of performance scores on benchmarks in this presentation

² Based on 4K HEVC 10-bit local video playback on Intel® Core™ i7-7500U at 66Whr battery and 4K panel
See appendix for configurations

7TH GENERATION

INTEL® CORE™ PROCESSOR



DESIGNED FOR THE IMMERSIVE INTERNET



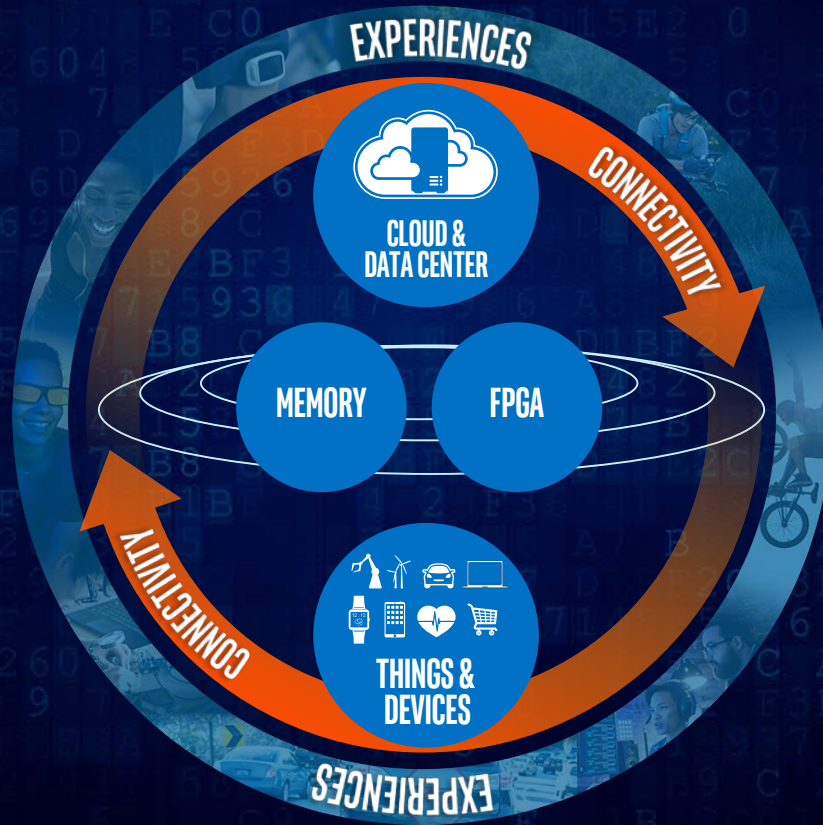
INTEL IS EVOLVING.

We're moving towards a world where the boundary between digital and physical is eroding, computing is truly mobile and ubiquitous, and **everything is smart and connected.**

INTEL'S VISION:

If it's smart and connected, it's best with Intel.

VIRTUOUS CYCLE OF GROWTH

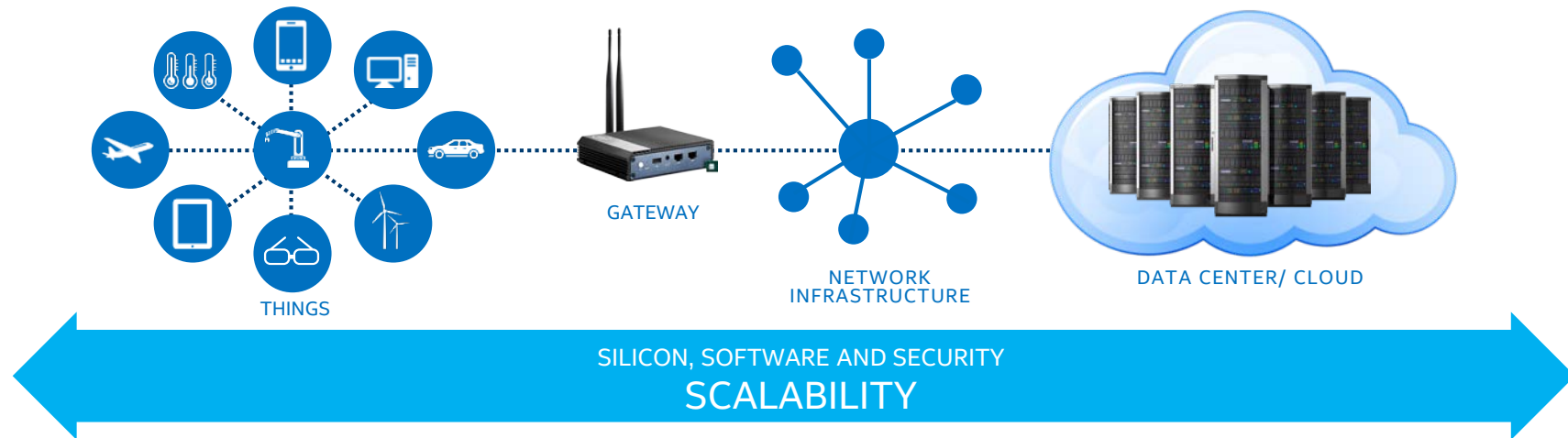




INVENTING THE FUTURE

**Intel is uniquely positioned to power
the cloud and drive the increasingly
smart, connected world.**

SMART: INTERNET OF THINGS



THE INTERNET OF THINGS:

Devices that connect to the Internet integrating greater compute capabilities using data analytics to extract information

IOT PLATFORM - PULLING IT ALL TOGETHER



Intel

Robert Noyce Building

RNB Home Page

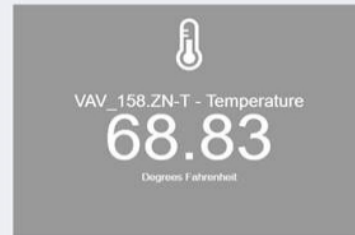
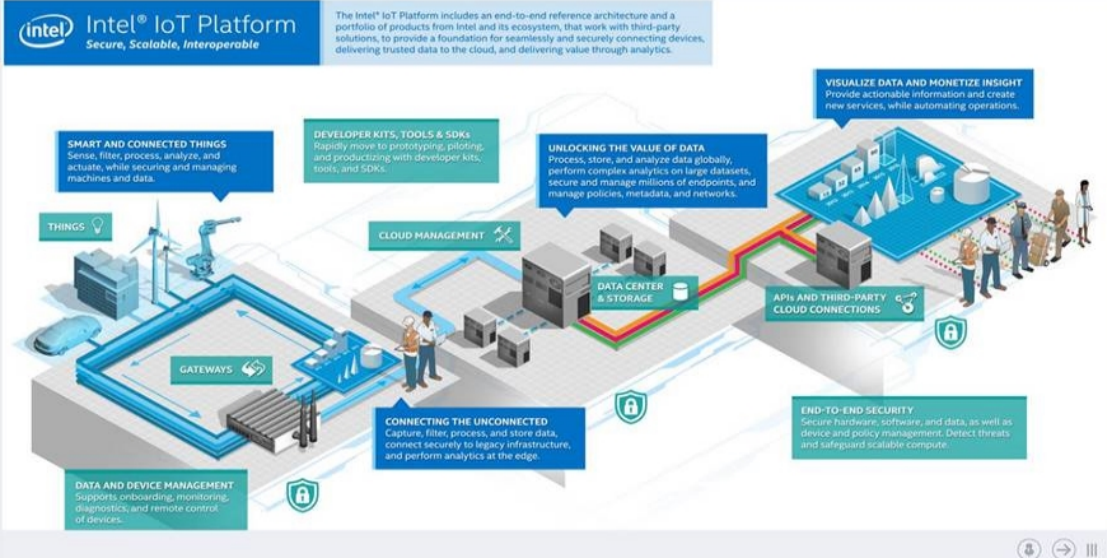


Local Weather

Santa Clara, California, United States

Overcast
50° - 63°

61 °F



Welcome to Explore Intel.

We've created this site to promote corporate transparency by sharing information on our environmental performance.



TRANSPARENCY LEADERSHIP

Environmental Information for Entire Facility

Additional Environmental Data

Water

518 Millions of Gallons

Water Conserved

612 Millions of Gallons

Water Consumption

Waste

82 %

Percent Non-Hazardous Waste Recycled

3,443 Short Tons

Non-Hazardous Waste Generated

0 %

Percent Hazardous Waste to Landfill

3,728 Short Tons

Hazardous Waste Generated

Energy

10,639,773 kWh

Electricity Saved (kWh)

348,282,377 kWh

kWh Used

7,512 MTCO_{2e}

CO₂ Saved

Air

156,795 Tons of CO₂ Equivalent

Greenhouse Gas (GHG) Emissions

12 Short Tons

Volatile Organic Compounds (VOC)

2.51 Short Tons

Hazardous Air Pollutants (HAPs)

5.71 Short Tons

Oxides of Nitrogen (NO_x)

9.3 Short Tons

Carbon Monoxide (CO)

0.77 Short Tons

Total Fluorides (F) from RA and AL

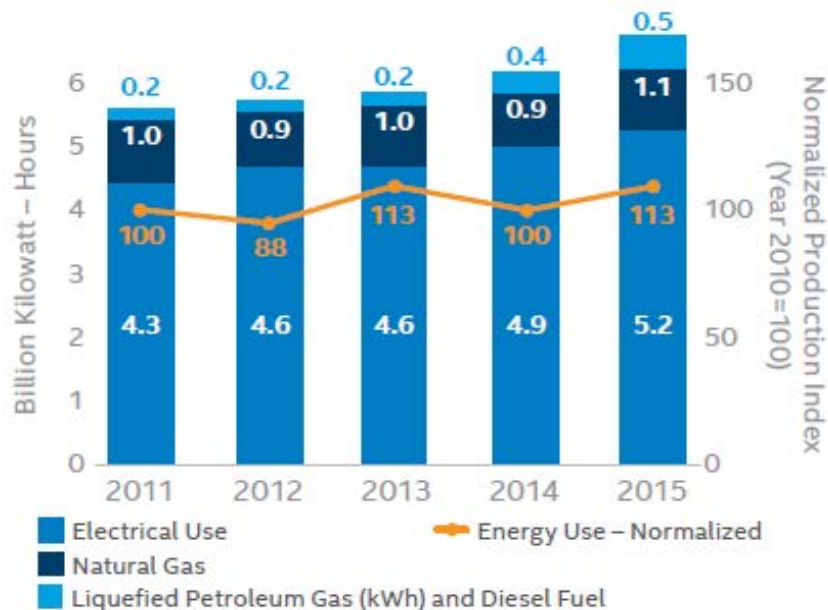
Intel has revised the waste reporting categories making them consistent with how other technology and semiconductor manufacturers report their data. Prior to 2014 Intel reported waste data as solid and chemical waste. Now the waste data is divided into non-hazardous waste and hazardous waste. Hazardous waste includes waste with certain attributes defined as hazardous by country-level regulations; other waste such as plastics, metal, and paper falls into the non-hazardous waste category.

Exploreintel.com – Openly sharing our environmental performance

GOALS FOR 2016 AND BEYOND

Report Section	Goal
Product Stewardship	<ul style="list-style-type: none"> • Increase the energy efficiency of notebook computers and data center products 25x by 2020 from 2010 levels.¹ • Implement an enhanced green chemistry screening and selection process for 100% of new chemicals and gases by 2020.
Our People	<ul style="list-style-type: none"> • Achieve full representation² of women and underrepresented minorities at Intel in the United States by 2020.
Environmental Sustainability	<ul style="list-style-type: none"> • Reduce direct greenhouse gas (GHG) emissions by 10% on a per unit basis by 2020 from 2010 levels. • Grow the installation and use of on-site alternative energy to three times our 2015 levels by 2020. • Continue 100% green power in our U.S. operations and increase alternative energy use for our international operations from 2015 to 2020. • Reduce water use on a per unit basis below 2010 level by 2020. • Achieve cumulative energy savings of 4 billion kWh from 2012 to 2020. • Achieve zero hazardous waste to landfill by 2020. • Achieve 90% non-hazardous waste recycle rate by 2020. • Design all new buildings to a minimum LEED* Gold certification between 2015 and 2020.
Supply Chain Responsibility	<ul style="list-style-type: none"> • Complete or review an on-site audit for each of our Top 75 suppliers by the end of 2016. • Establish an 85% "green" Intel ground transportation fleet by 2016. • Validate our broader product base as conflict-free in 2016.³ • Increase our annual spending with certified diverse-owned suppliers to \$1 billion by 2020.
Social Impact	<ul style="list-style-type: none"> • Through the Intel She Will Connect program, reach 5 million women in Sub-Saharan Africa by 2020.

Energy Use



Our energy use calculations are based on Global Reporting Initiative G4 guidelines, the World Resources Institute/World Business Council for Sustainable Development's The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, and internal criteria defined by Intel management.

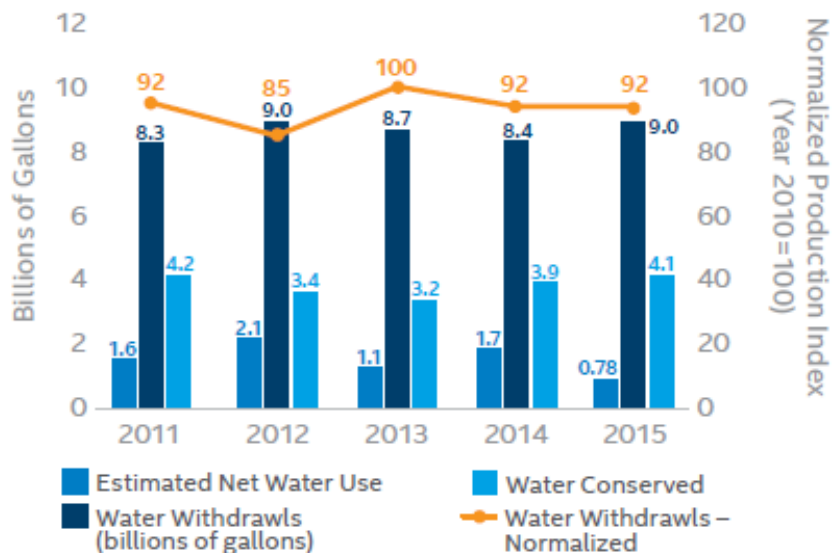
Energy Use

Goal: Achieve cumulative energy savings of 4 billion kWh from 2012 to 2020.

Progress: On track

Commentary: Since 2012, we have achieved cumulative energy savings of 1.6B kWh and remain on track to hit our 2020 energy goal. Our 2015 absolute energy use increased 10% compared to 2014, and our 2015 normalized energy use increased 13% from 2014 through 2015 as we ramped up new factories.

Water Use



Our water use calculations are based on internal criteria defined by Intel management. We define water withdrawals as total gallons of potable water (i.e., drinking water) used in our operations. "Operations" includes all manufacturing and non-manufacturing sites that use more than 35 gallons of water per person, per day.

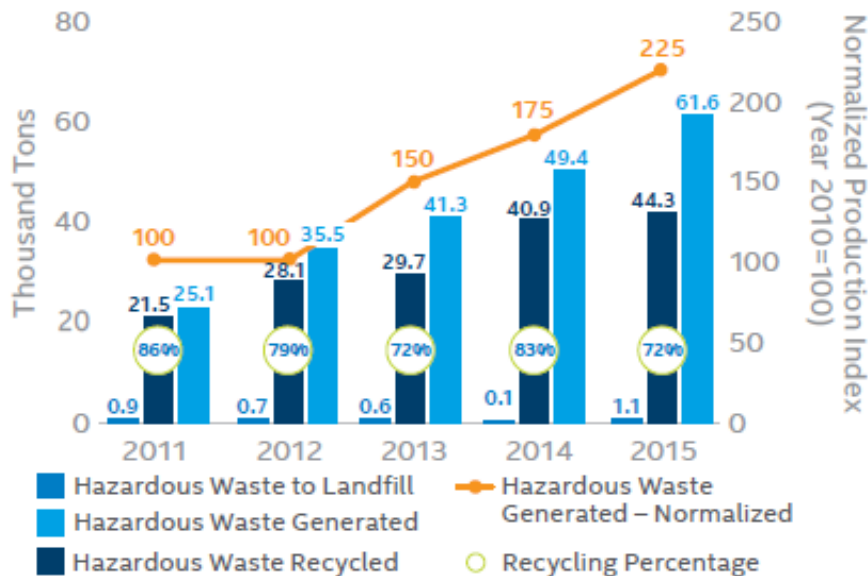
Water Use

Goal: Reduce water use on a per unit basis below 2010 level by 2020.

Progress: On track

Commentary: In 2015, our absolute water withdrawals increased by 7%, while our normalized water withdrawals remained flat. While our normalized water use is 8% lower than our 2010 baseline figure, as our manufacturing processes continue to evolve, we expect them to become more water-intensive, and our water withdrawals may increase. To address this issue, we have put a team of internal experts in place to investigate and develop a comprehensive plan to address our growing water use.

Hazardous Waste



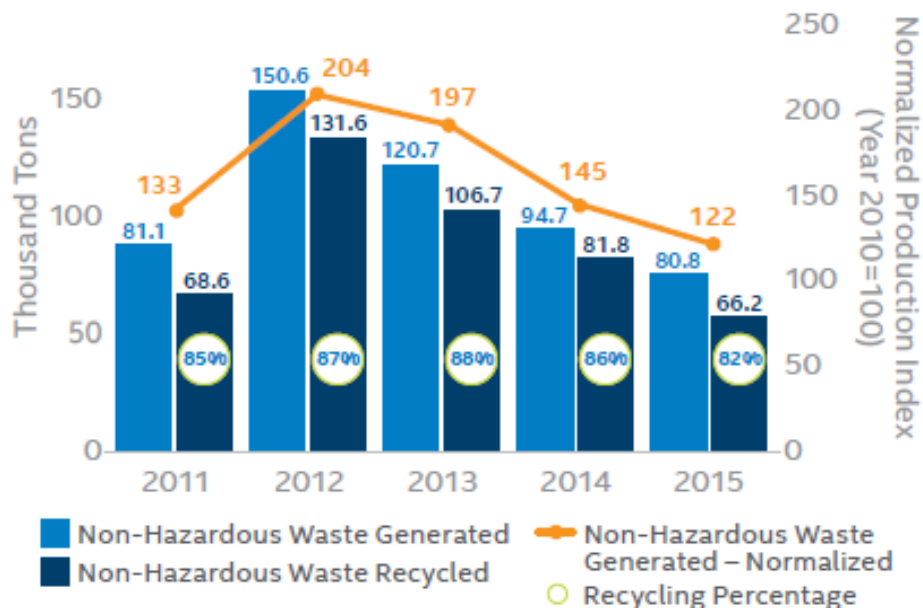
Hazardous Waste

Goal: Achieve zero hazardous waste to landfill by 2020.

Progress: On track

Commentary: In 2015, we sent just 2% of our hazardous waste to landfill, and we are on track to achieve our 2020 goal. From 2014 to 2015, our absolute and normalized hazardous waste generated increased 25% and 50% respectively, primarily due to new manufacturing processes that are more chemical-intensive. However, we were able to find novel recycle, reuse, and treatment technologies to keep these chemicals out of the landfill.

Non-Hazardous Waste



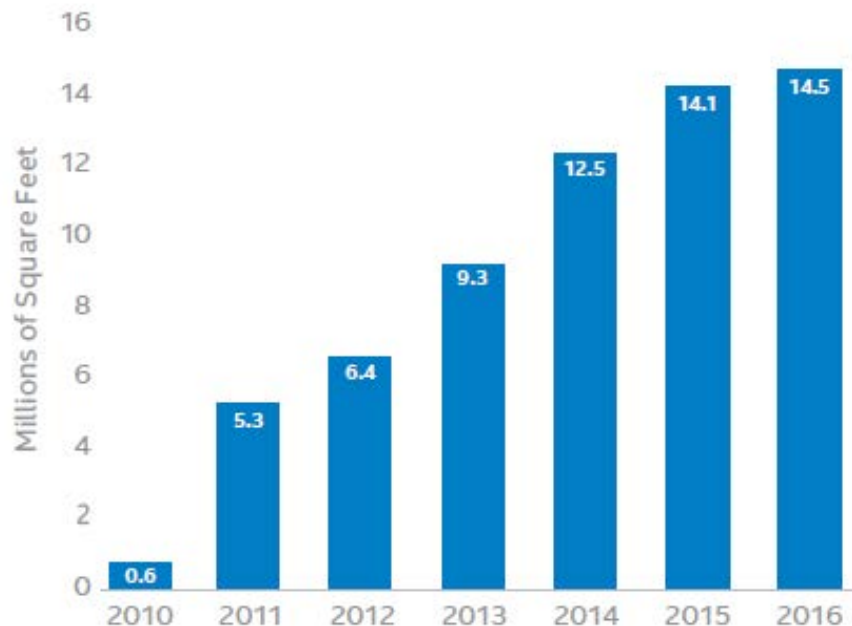
Non-Hazardous Waste

Goal: Achieve 90% non-hazardous waste recycle rate by 2020.

Progress: On track

Commentary: We recycled 82% of our non-hazardous waste in 2015, and are on track to reach our 2020 goal. We generated 15% less non-hazardous waste in 2015 compared to 2014, primarily due to the completion of construction projects. Our normalized non-hazardous waste generated also decreased by 23%.

LEED Certified Square Footage¹



¹ Global, cumulative

Green Buildings

Goal: Design all new buildings to a minimum LEED Gold certification between 2015 and 2020.

Progress: On track

Commentary: We have achieved LEED certification for over 14.5 million square feet of space in 45 buildings around the world (approximately 25% of our total building space), and are on track to achieve our goal.

Intel Arizona

- One of the largest and most complex semiconductor manufacturing facilities in the world
- 12 of 14 original buildings LEED Silver Certified ~3.9 Million sq. ft
- Capital investment of \$20 billion in manufacturing at the Ocotillo site since 1996 (Intel established AZ operations in 1979)
- 2007 EPA Water Efficiency Award Winner
- YTD solar voltaic power output equivalent to 164 homes annual consumption
- \$5.3 billion annual economic impact to Arizona
- 11,000 employees - \$148,000 average total compensation of 12,000 homes
- Intel was ranked No. 1 by the Phoenix Business Journal for total LEED-certified space in Arizona
- Presented OBRI partnership at Global Water Summit
- H1 2016 Solid Waste recycle 93%
- Installed solar energy system for 1000 homes support almost 35,000 households for a family of four per year
- In 2015, Intel Arizona had a non-hazardous solid waste recycling rate of 87%



Environmental Scan

- Site Environmental Data is reported quarterly on the Explore Intel Website:
 - <http://exploreintel.com/>
- Semi-Annual Title V Compliance Monitoring Report
 - Site checked, validated, and certified compliance to ~450 air permit compliance items
 - System includes robust management review including internal compliance sign-off by all Area Managers
 - Report signed by Site Vice President responsible for OC Manufacturing
 - 2 Deviations were reported
 - Contractor paint buckets without lids (VOCs)
 - Isopropyl Alcohol improperly contained and open to atmosphere (VOCs)
- Unannounced Air Quality Inspection (MCAQD) – 2 Days onsite and detailed records request
 - All abatement equipment walked, factory and subfab, solvent storage and containers walked for compliance
 - Documentation review of all required records
 - **No findings** or NOV's were noted

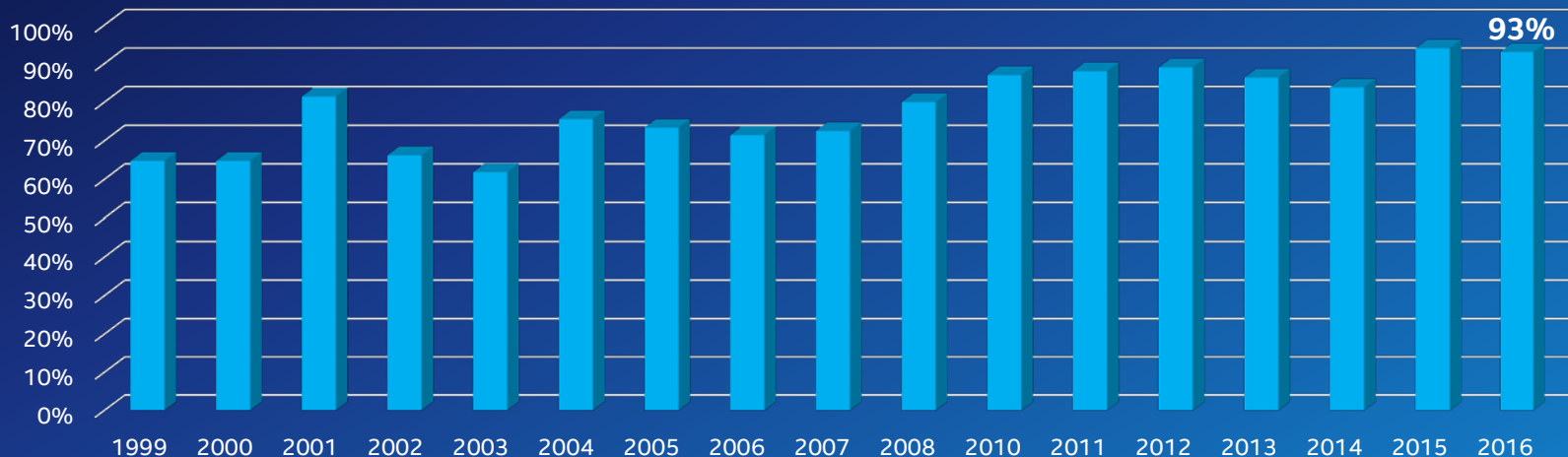
Environmental Scan

- Title V permit revision complete
 - Added 3 new EGENs
 - New ultra-low NOx burners retrofitted into older boilers
 - VFD upgrades on VOC abatement for improved CO/NOx performance
- H1 Wastewater monitoring completed with no issues

RECYCLING AT OCOTILLO

From 1999 to H1 2016 a total of 183,111 tons were recycled of the 233,280 tons shipped off site in total

Ocotillo Recycling % Over Time



Intel, Arizona Flows

City Water



Internal Reclaim

"Toolbox"
Technologies

Ultra Pure Water

FABs

Wastewater Treatment

"Evap"
Ponds

Ocotillo
Brine
Reduction
Facility

Air Scrubbers

CT
Reclaim

Cooling Towers

Aquifer
Recharge

Irrigation

Reclaimed Water

Municipality
Treatment Works

City Water Demand (MGD)

8.9

-1.1

-1.1

-1.9

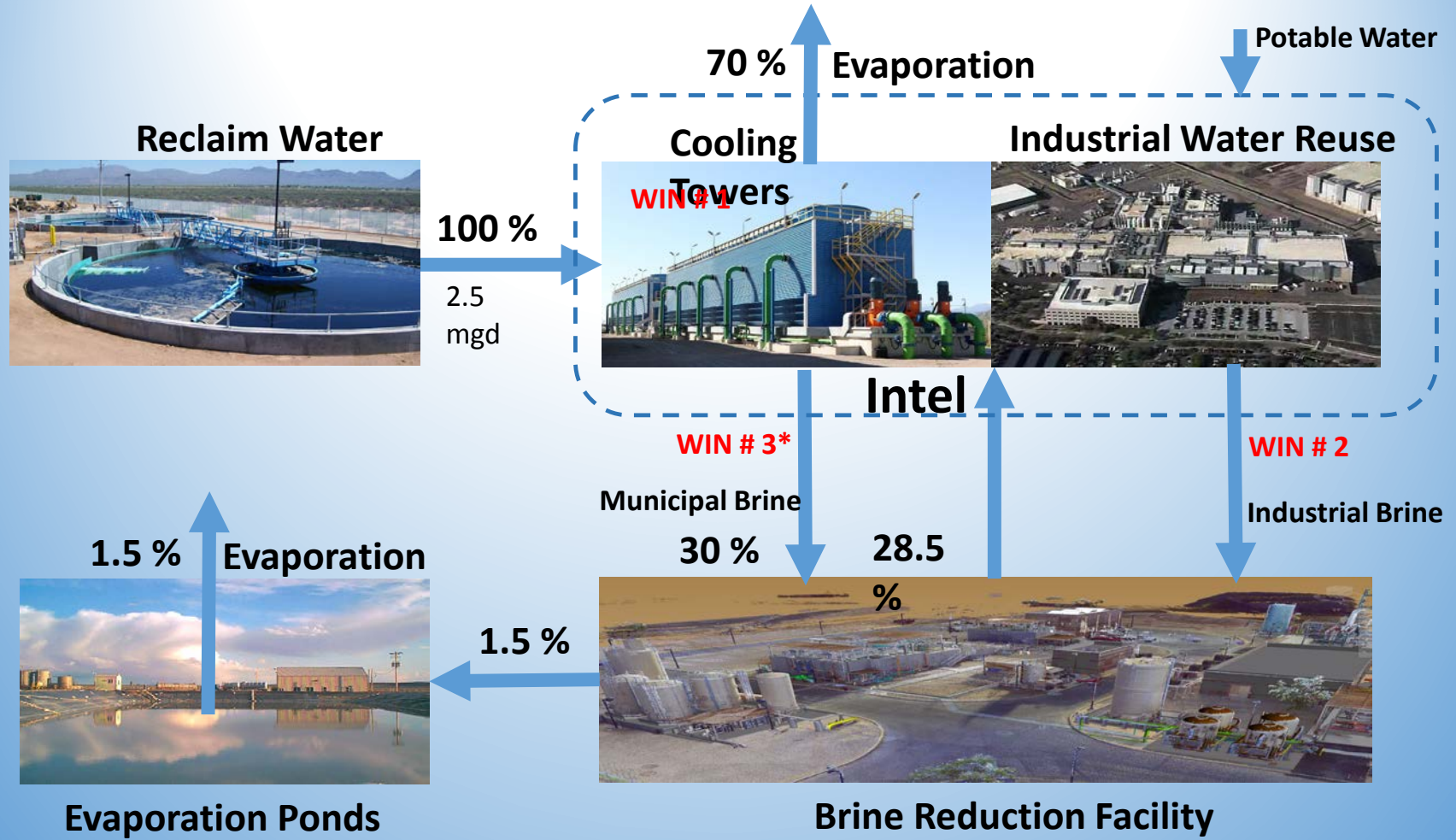
-0.6

Net

4.2



Municipal Reclaim Water Path – Intel Driven



Ocotillo Brine Reduction & Water Reclaim Facility



OBRF can treat 2.8 mgd of high TDS brine (Industrial Brine, Win#2, 95% recovery, 98% salt removal) to high purity levels enabling re-use in semi-conductor plant, non process operations. The plant can also remove ~40 million lbs./year of dissolved solids. Plant achieves Zero Liquid Discharge (ZLD) in the most energy efficient manner through a combination of thermal brine concentrator and evaporation ponds

Questions?