
CCIF

CRITICAL CONSUMER
ISSUES FORUM

Connecting Communities

Smart Cities, Enabling Technologies, and the Grid



July 2017



Formed in 2010, the Critical Consumer Issues Forum (CCIF) brings state commissioners, consumer advocates, and electric utility representatives together to tackle consumer-focused energy issues through interactive discourse and debate, to find consensus when possible, and at a minimum, to achieve a clearer understanding of—and appreciation for—each other's perspectives and positions.



DG: A Balanced Path Forward: Providing Customer Choice While Ensuring Reliability

Grid Modernization Issues with a Focus on Consumers

Focus on the Regulatory Process

Consumer Solutions: Meeting Consumer Needs on All Levels

Policy Considerations Related to Distributed Energy Resources

The Evolving Distribution System: Helping Consumers Navigate Access to Products, Services and Technologies



ROAD TRIP











We got problems









SAN DIEGO

COMIC CON





Smart Communities use technology
and innovation to solve
real problems and benefit citizens.

Smart Community Attributes



Smart & Connected

Data-Driven

Resilient

Sustainable

Mobile

Economically Competitive

Inclusive

FR-D FREE RIDE
SAN DIEGO EVERYWHERE DOWNTOWN

**Advertise
Here!**

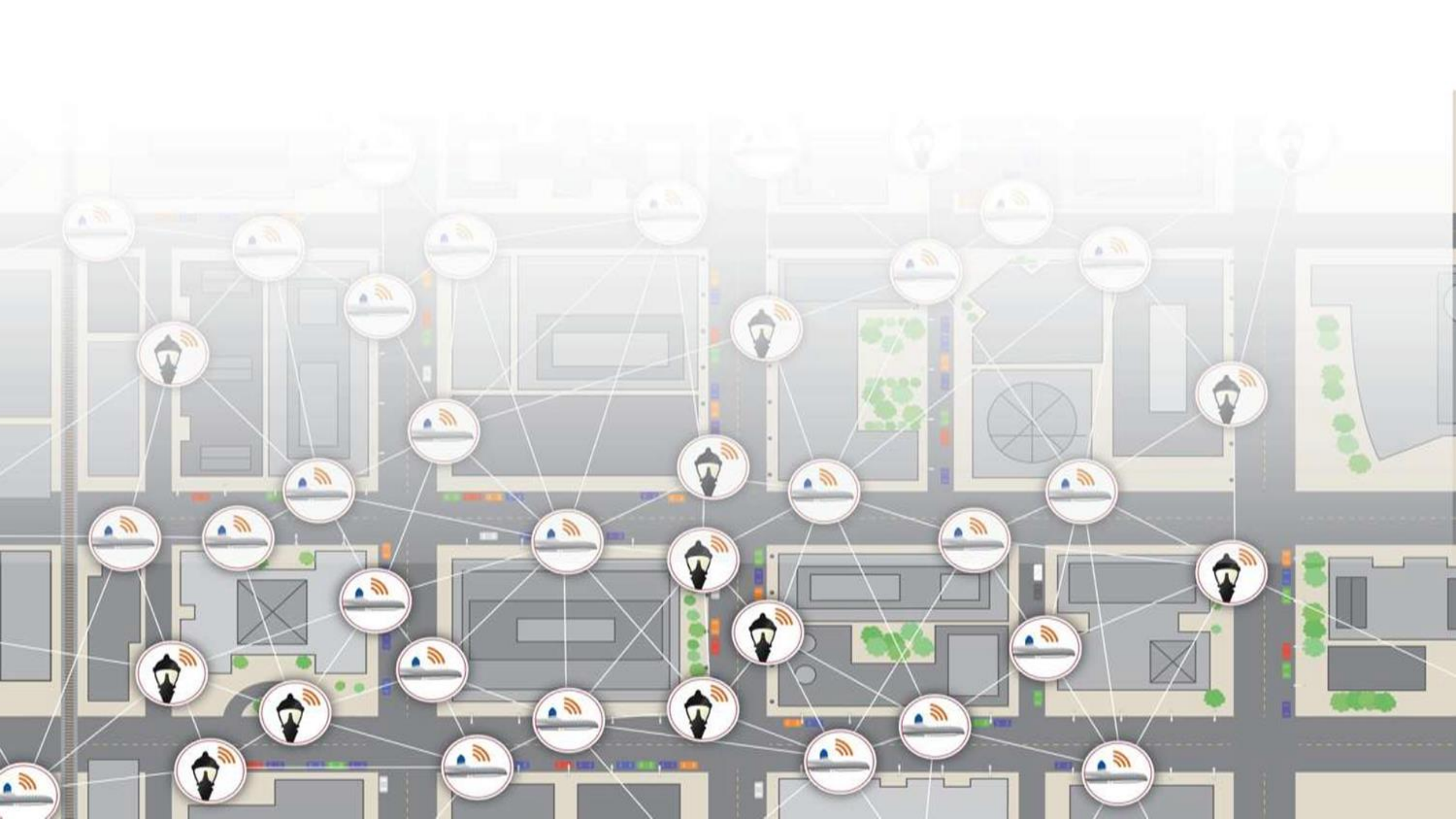
sales@thefreeride.com



**WANT YOUR BUSINESS
SEEN BY MILLIONS?**

sales@thefreeride.com

**CUSTOM CAMPAIGNS
VIDEO ADS & MORE!**





NEW TONIGHT

**STORIES
THAT
MATTER**

**STONE BREWING USES WASTEWATER TO BREW BEER
LIBERTY STATION**















Figure 2 The initial proposal includes public WiFi, smart lighting and community kiosks. The platform can easily be expanded by adding smart transit, water, infrastructure and parking applications.



RideKC STREETCAR

802

CITYPOST

OFFICE OF CULTURAL AFFAIRS
American Jazz Museum
Exhibition (thru Sept. 30)
Touch for more
JAZZ SPIRITS FOR LIFE
KIDZ ROCK

Ultra-high fidelity
media anywhere



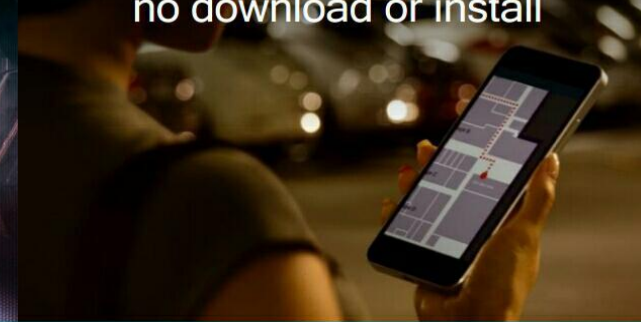
User-generated content



Immersive virtual reality



Instant apps -
no download or install



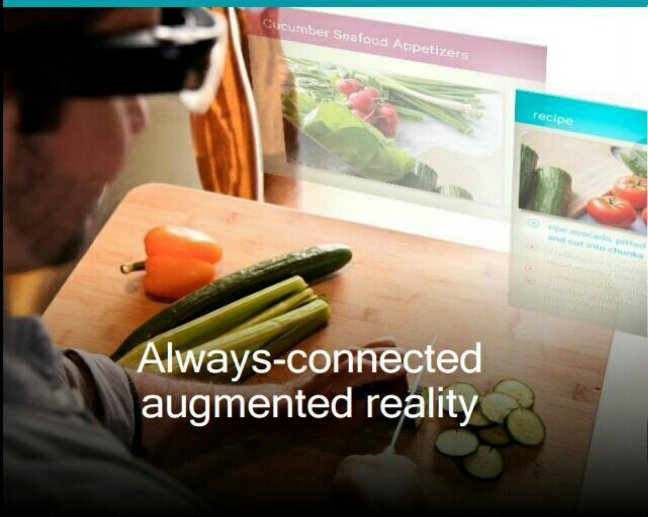
Delivering fiber-like performance without the wires—

Ushering in the next generation of highly immersive,
always-connected user experiences

1.6GB ➤ 6.8GB

Growth in average smartphone traffic per month
from 2016 to 2021

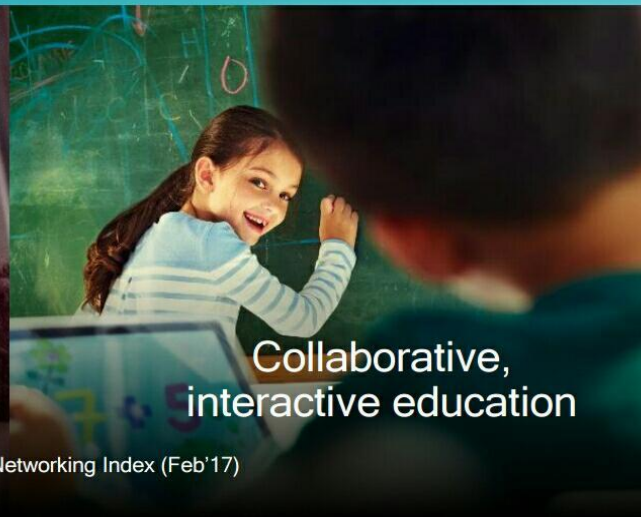
Always-connected
augmented reality



Collaborative,
immersive gaming



Collaborative,
interactive education



Connected
cloud computing



Source: Cisco Visual Networking Index (Feb'17)

Core Values

Rapid Urbanization

Technology, Innovation & Data

Aging Infrastructure

Economic Development

Safety & Security

Environment & Sustainability

Resilience

Mobility & Access to Critical Services

Access to Technology

Return on Investment



Global smart city revenue is expected to grow from \$36.8 billion in 2016 to \$88.7 billion by 2025.

- Navigant Research









.INTRODUCING.



SMART



welcome to pittsburgh!

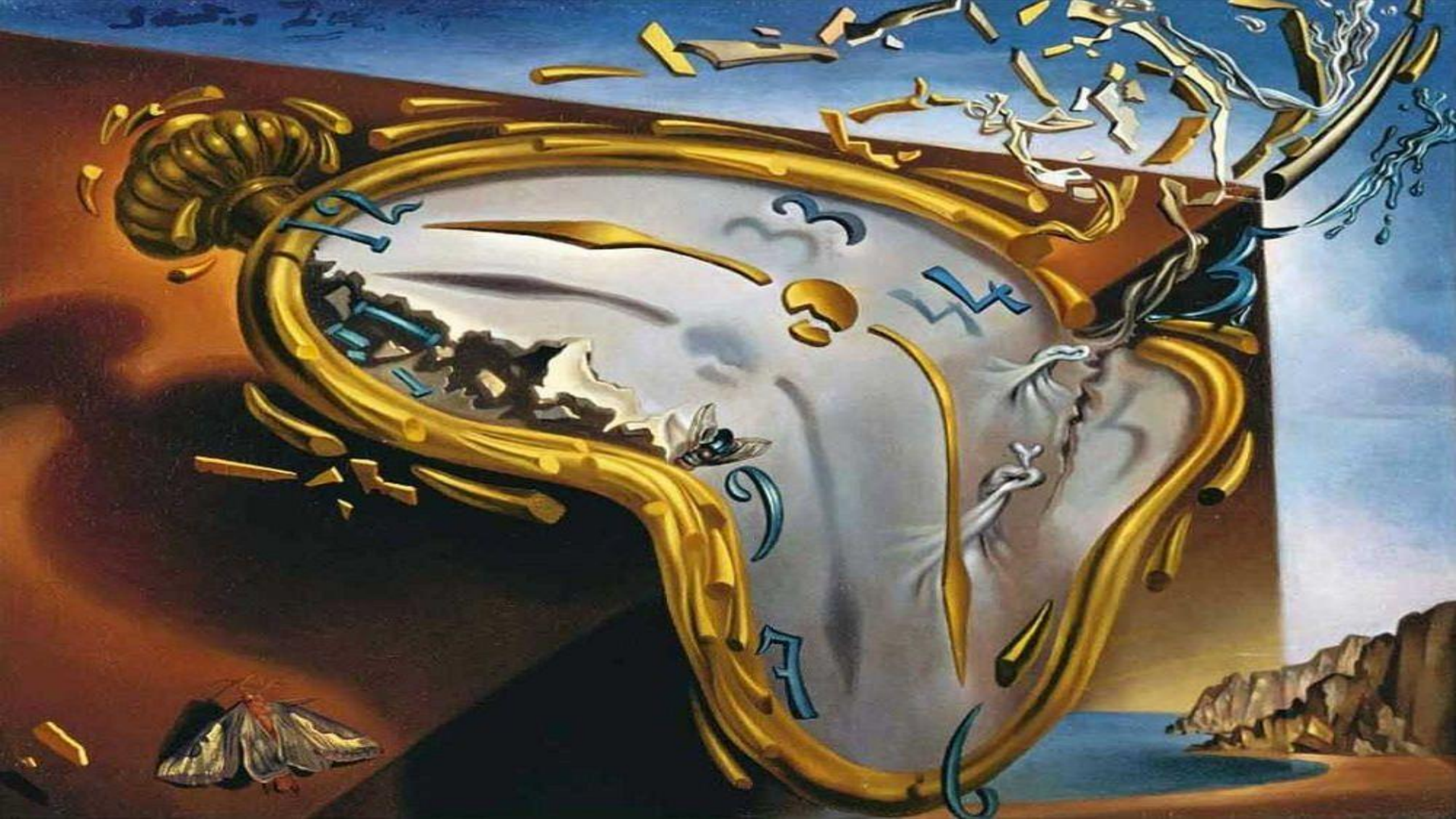
1940 - 1950

For a century, Pittsburgh was a coal-reliant industrial powerhouse, and one of the most smog-choked cities in America. Sometimes gas lights had to be turned on at noon because of heavy smoke.

Air control ordinances passed in 1946. Residents and businesses were surprisingly eager to pay more for cleaner energy, even when it meant expensive heating bills during Pittsburgh's brutal winters. The air improved dramatically.

The photos below were taken between 1940 and 1950, archived in the Smoke Control Lantern Slide Collection, and used with the permission of the University of Pittsburgh Library





AND

WYOMING

SPEED
LIMIT
35







Advanced Metering Infrastructure

Microgrids

Low-income neighborhood energy efficiency

Rooftop Solar

Multi-Year IoT Strategy

Distributed Energy Generation

Wi-fi Enabled Dog Parks

Weatherization

Energy Efficiency Upgrades

Multi-Purpose Infrastructure for Mobility

GIS Mapping

EV Charging Infrastructure

Resiliency Planning

Electrification

Bill Assistance

WBCSD Zero Emission Cities

Rural Infrastructure Deployment

On-Bill Financing

Commercial Building Efficiency

Climate Action Plan

Web Enabled Customer Feedback

Traits of Smart Cities

Microgrids

Low-income neighborhood energy efficiency

Rooftop Solar

Multi-Year IoT Strategy

Distributed Energy Generation

Weatherization

Energy Efficiency Upgrades

Multi-Purpose Infrastructure for Mobility

GIS Mapping

EV Charging Infrastructure

Resiliency Planning

Electrification

Bill Assistance

Advanced Metering Infrastructure

Rural Infrastructure Deployment

Climate Action Plan

On-Bill Financing

Commercial Building Efficiency

Web Enabled Customer Feedback

Regulatory Policy Nexus

A vibrant cityscape at sunset, featuring a river in the foreground with bridges and a dense skyline of skyscrapers in the background. The sky is filled with colorful clouds, and the sun is low on the horizon, creating a warm glow. The city's reflection is visible in the water.

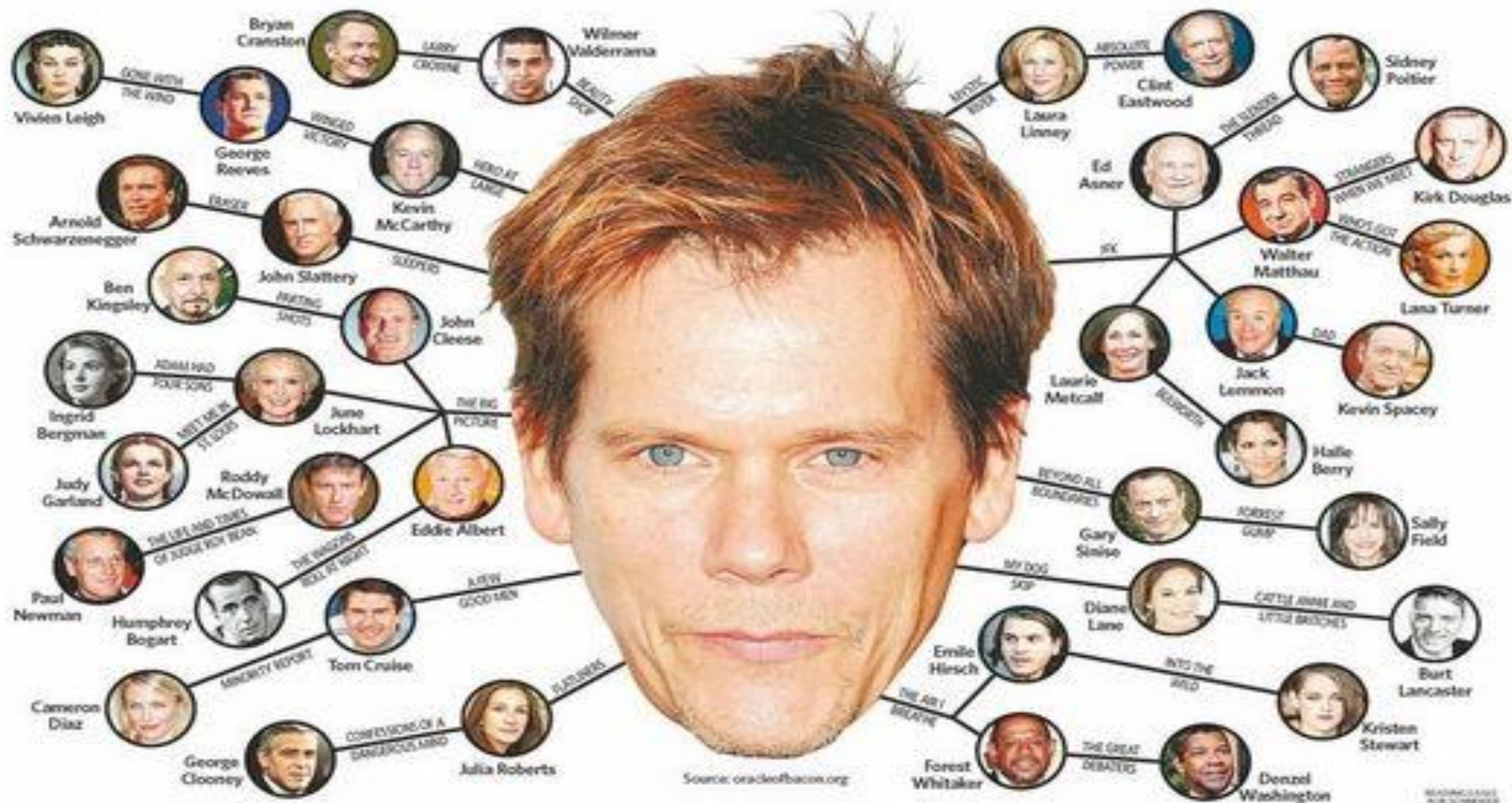
Grid Modernization
Clean Energy
Customer Energy Solutions

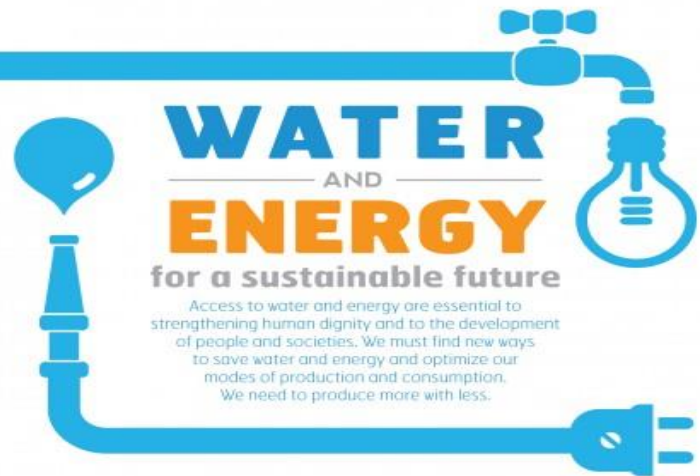




DOES EVERYONE HAVE 6 DEGREES OF SEPARATION FROM KEVIN BACON?







WATER AND ENERGY

for a sustainable future

Access to water and energy are essential to strengthening human dignity and to the development of people and societies. We must find new ways to save water and energy and optimize our modes of production and consumption. We need to produce more with less.

THE WATER-ENERGY NEXUS

WATER AND ENERGY ARE HIGHLY INTERCONNECTED AND INTERDEPENDENT



ALL WATER SERVICES REQUIRE AN INPUT OF ENERGY. ENERGY PRODUCTION ACCOUNTS FOR 15% OF THE WORLD'S TOTAL WATER WITHDRAWALS.

This average should increase by **20%** from now to **2035**
- Producing more energy comes at the cost of water



90% of all electricity generation is water intensive



80% of the world's electricity is generated by thermal power

WATER AND ENERGY: A TWO-WAY RELATION



Water for energy

To diversify and enhance their energy supplies, certain countries have turned towards alternative and unconventional fuels, such as biofuels and shale gas (via hydraulic fracturing), which require lots of water



Energy for water

In several areas where freshwater resources are scarce or limited, a growing number of water desalination plants have been developed to cope with increasing demands for water, and these require lots of energy

MEETING THE WATER AND ENERGY NEEDS OF PEOPLE AND SOCIETIES



768 million people don't have access to clean water



3.5 billion people's right to water is not satisfied



2.5 billion don't have access to adequate sanitation



1.3 billion have no electricity



2.6 billion use solid combustion - essentially biomass - to cook

The world population is increasing by **80 million** people each year



By **2050** the world will need:

+55% water

+60% food

+70% energy

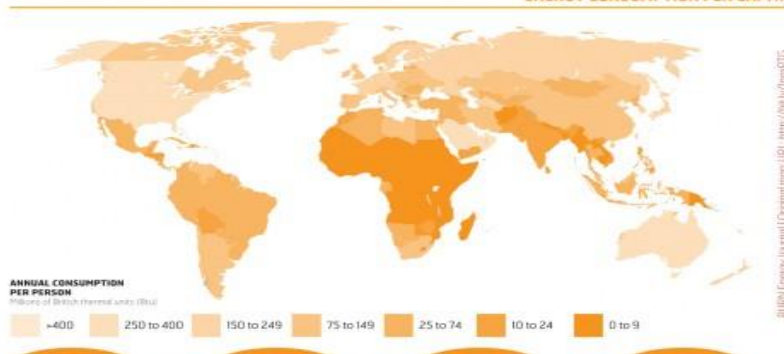
+100% electricity

THE CHALLENGE WILL BE GREATEST WHERE WATER RESOURCES, INFRASTRUCTURE AND SERVICES ARE INADEQUATE OR SCARCE



GLOBAL PHYSICAL AND ECONOMIC WATER SCARCITY

ENERGY CONSUMPTION PER CAPITA



... AND WHERE MODERN ENERGY SERVICES REMAIN LARGELY UNDERDEVELOPED



Those who lack access to improved water and sanitation are also likely to lack access to electricity, and rely on solid fuel for cooking. The health consequences are devastating: Indoor air pollution is linked to respiratory disease, and the lack of safe drinking water and sanitation can result in chronic diarrhea. **Women and children represent a disproportionately high fraction of the unserved.**



PRODUCING ENERGY FROM WASTEWATER

Innovative ways of producing energy from wastewater



The water treatment plant La Farfana treats **50% of wastewater** of Santiago (Chile) and produces about 24 million liters of biogas. This energy, which replaces natural gas, benefits **100 000** people of the Santiago region



In Stockholm (Sweden) buses and taxis use biogas produced by wastewater plants



THE COST OF PROGRESS

What's needed to achieve universal water/energy access :



An extra **\$49 billion** per year needs to be invested to achieve universal energy access by 2030

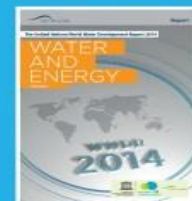


Additional partners, including the private sector, can help close the infrastructure financing gap



FOOD FOR THOUGHT

\$103 billion per year would have been necessary to finance water sanitation and treatment from 2000 to 2015



The contents of this infographic have been extracted from the **United Nations World Water Development Report (WWDR) 2014**. Download the report at: www.unesco.org/water/wwap



@UNWWAPUNESCO

UN WATER

#Science4Peace

THE ENERGY - WATER CHALLENGE



by **2035**
GLOBAL ENERGY
consumption will
INCREASE 50%



But still today ...

2.8 billion PEOPLE
live in areas of
HIGH WATER
SCARCITY

and **2.5** billion
PEOPLE have
UNRELIABLE or **NO**
access to
ELECTRICITY



CLIMATE
CHANGE
will impact both the
ENERGY and
WATER sectors

Roles

Regulators

- Adjudicator
- Convener
- Collaborator

Consumer Advocates

- Advocate
- Facilitator
- Advisor

Energy Company

- Service Provider
- Project Partner
- Collaborator



Cities need strong utilities...
and utilities need strong cities.
— Grant Ervin

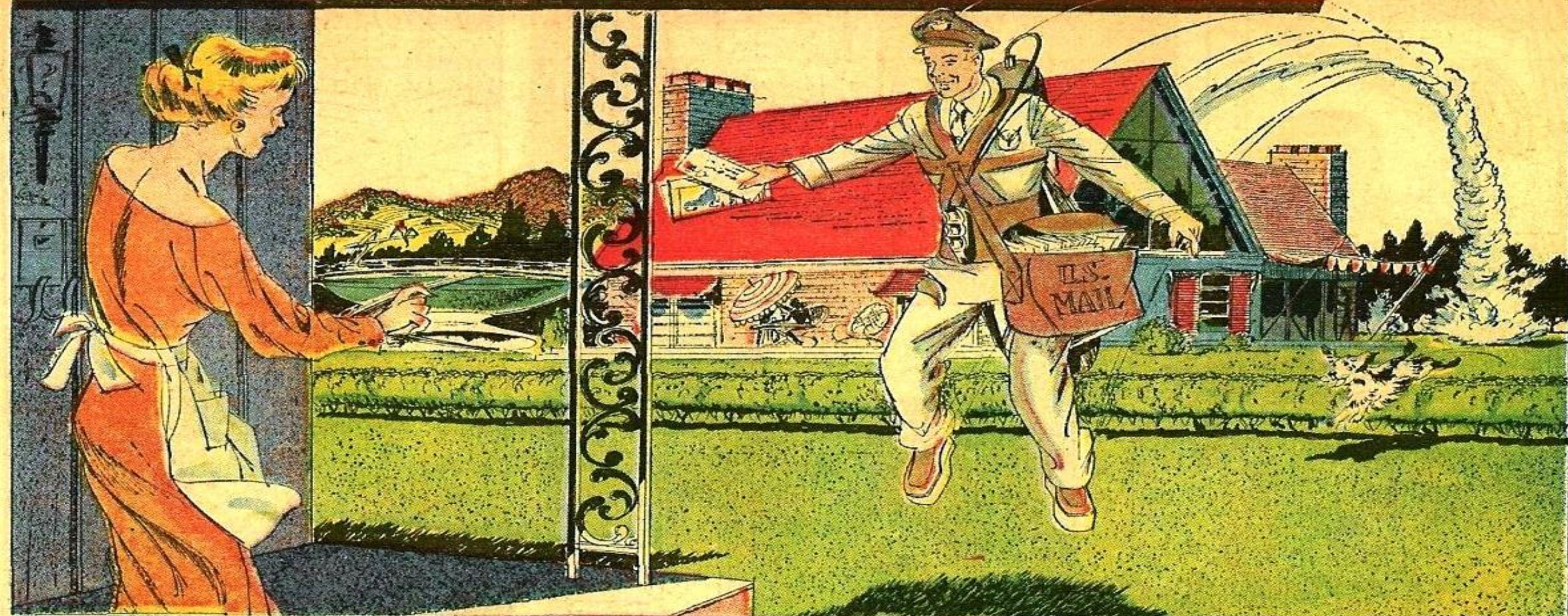






--- CLOSER THAN WE THINK!

by Rockbough



ROCKET MAILMEN Uncle Sam's mailmen can look forward to going faster, getting farther, and doing so with less effort than ever before. All it will take will be a device like the recently perfected "rocket assists" which were originally developed to help infantrymen leap like grasshoppers.

Just how such equipment works is still a military secret. The designer,

Reaction Motors, Inc., is not permitted to say how large the device is, or how long it fires, or what kind of fuel it uses. But best guess is that the rocket fires intermittently, so that the wearer can bound from spot to spot as he wishes, with no more energy than it takes to walk. Also the mechanism is believed to be of small size, simply constructed and low-priced. What a boon for mailmen and others whose work takes them from door to door!















WCCD

WORLD COUNCIL ON CITY DATA

THE DUBAI DECLARATION 2017

A Commitment to City Data as the Universal Language

Driving forward three critically important agendas for 2030:



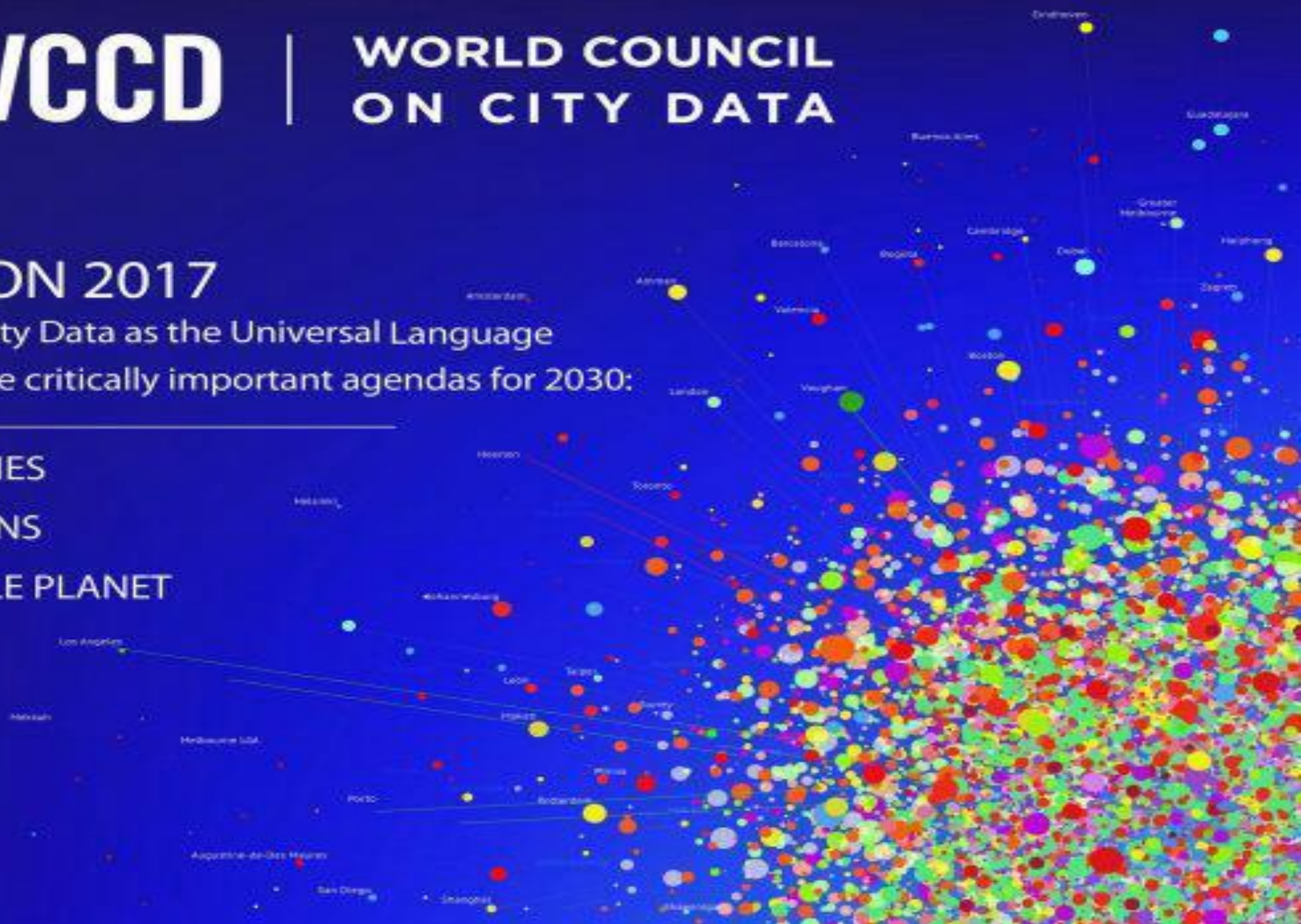
INCLUSIVE CITIES



SMART NATIONS



A SUSTAINABLE PLANET



Report these types of problems through *Get It Done*

Parking Meters

Graffiti

Damaged
Guardrail

Sidewalk Repair

Abandoned
Vehicle

Storm Drain

Potholes

Dead Animal

Street Light Out

Traffic Signs

Traffic Signals

Clogged Storm Drain
Litter/Dumping
on Street/Sidewalk
Storm Water
Code Enforcement
Street Sweeping

Tree Hazards

Curb-related
Issues

Streets


Street Flooded


Illegal Dumping





Connecting Communities

Smart Cities, Enabling Technologies, and the Grid



July 2017



80 Research Institutions
\$4.6 Billion Direct Impact
100,000 jobs in Science and R&D
\$14.4 Billion total impact




LOVE





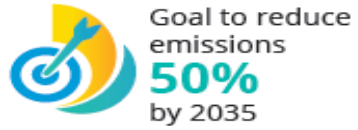




Founded 2011
Sold to 
\$3.2 Billion

2016 SD sustainability annual report

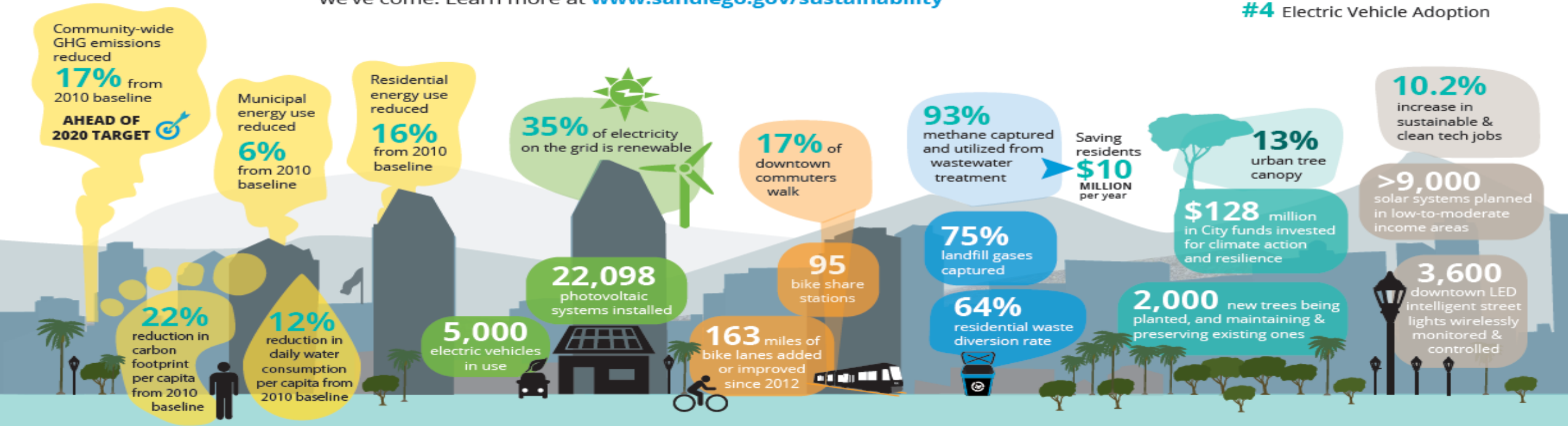
2016 SD sustainability annual report
*Based on 2015 data



San Diego has set a new national standard for climate action and presents a bold vision for our future. We have committed to cutting greenhouse gas (GHG) emissions in half by 2035. We are also one of the first and largest cities in the nation to commit to 100% renewable energy. We are a Smart City making better use of resources, sustainability and technology. Our first sustainability annual report shows how far we've come. Learn more at www.sandiego.gov/sustainability

National Rankings

- #1 Largest Electric Vehicle Day
- #2 Solar Installations
- #3 Clean Tech Leadership
- #4 Electric Vehicle Adoption



ENERGY & WATER EFFICIENCY IN BUILDINGS



CLEAN & RENEWABLE ENERGY



BIKING, WALKING, TRANSIT & LAND USE



ZERO WASTE



RESILIENCY



SOCIAL EQUITY AND JOB CREATION

The City of
SAN DIEGO

"Create and sustain a resilient and economically prosperous city"
- City of San Diego Strategic Plan Vision

2016 U.S. Clean Tech Leadership Index

SAN DIEGO, CA

KEY FACTS



1000+

LEED and Energy Star buildings



\$828M

in VC funding in the last 3 years

#2

in installed solar per capita



14,366

EVs (680% more than in 2012 Index)

#3 OVERALL

in Metro Index (Top 5 in 3 of the 4 Index categories)

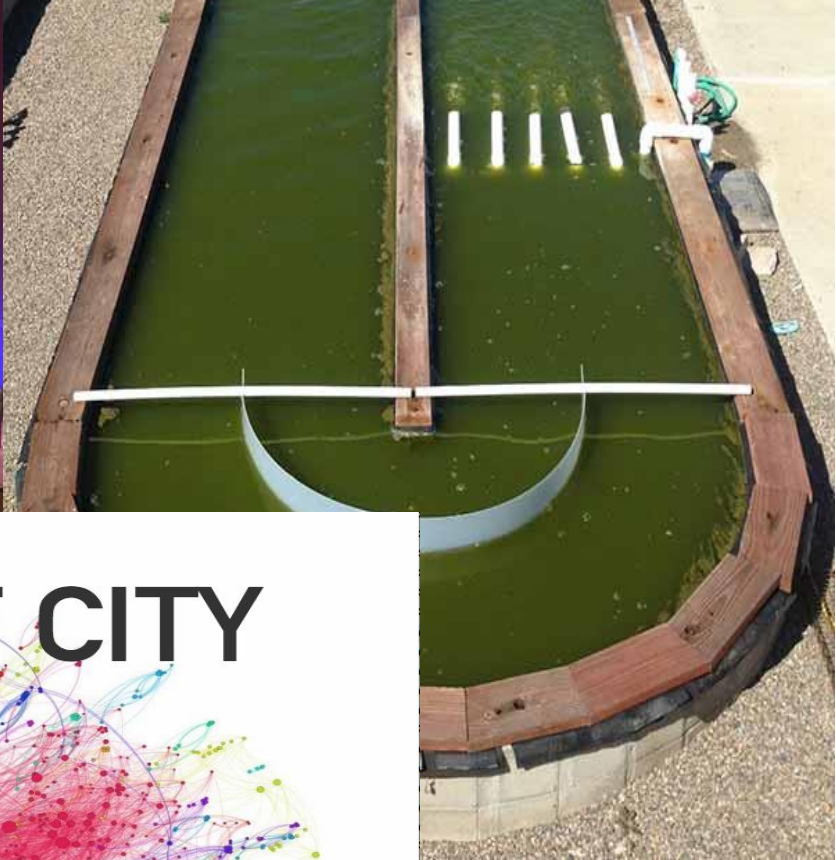
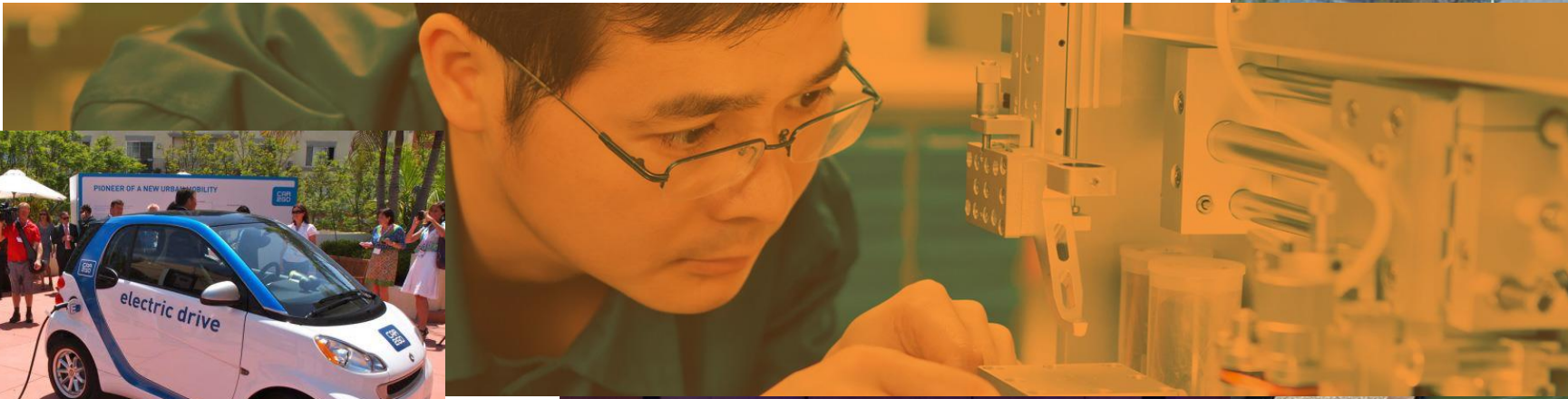
1 of 3

cities in Index with a 100% renewable electricity pledge

CALIFORNIA:

#1

in Leadership Index all 7 years (and #1 in Policy)



SAN DIEGO SMART CITY HACKATHON

[HARNESS THE DATA]

Ultra-high fidelity
media anywhere



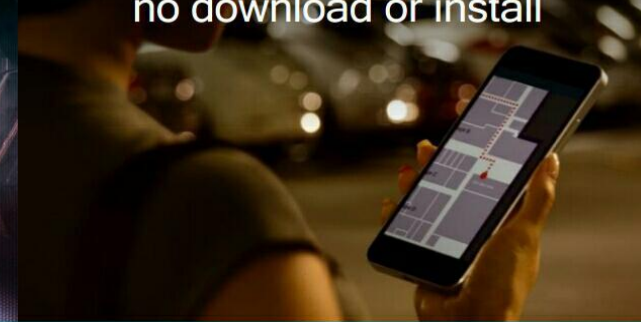
User-generated content



Immersive virtual reality



Instant apps -
no download or install



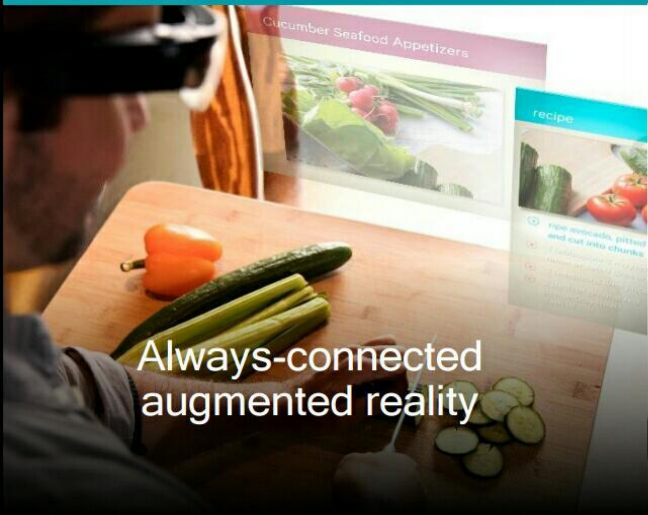
Delivering fiber-like
performance without the wires—

Ushering in the next generation of highly immersive,
always-connected user experiences

1.6GB ➤ 6.8GB

Growth in average smartphone traffic per month
from 2016 to 2021

Always-connected
augmented reality



Collaborative,
immersive gaming



Collaborative,
interactive education



Connected
cloud computing



Source: Cisco Visual Networking Index (Feb'17)

\$\$ For Used Phones

ecoATM
Automated Recycling Stations



\$\$ For Used Phones

ecoATM
Automated Recycling Stations

The Approach

Think Platform

Default = Open

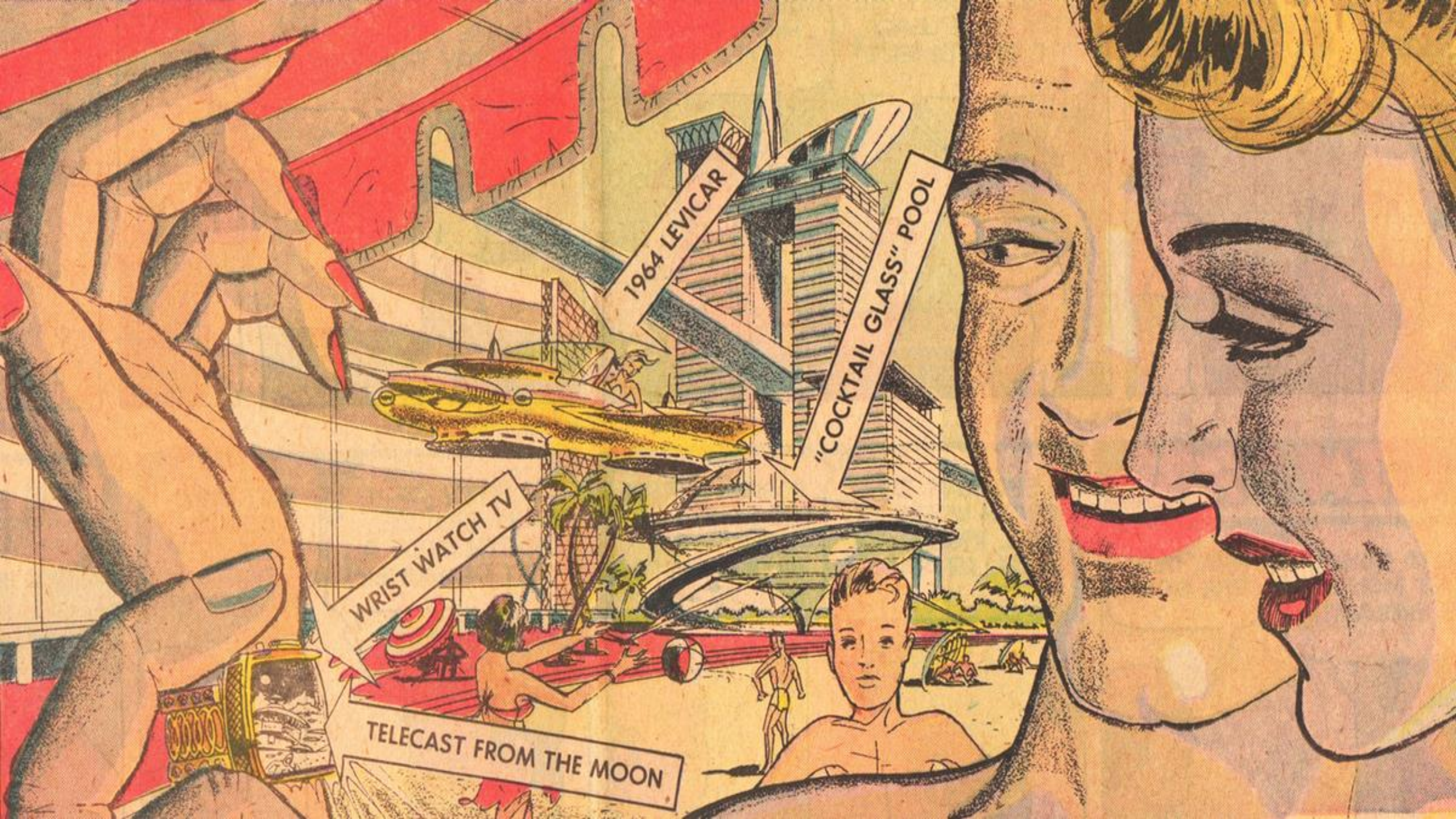
Fix ++

Human Centered Design

Data Empowered Decisions







1964 LEVICAR

"COCKTAIL GLASS" POOL

WRIST WATCH TV

TELECAST FROM THE MOON

... CLOSER THAN WE THINK! ...

by Radebaugh

SUNRAY SEDAN

Tomorrow the sunmobile may replace the automobile. The power of bottled sunshine will propel it. Your solar sedan will take energy from sunrays and store it in accumulators that work like a battery. This power will drive your car just like gasoline does today.

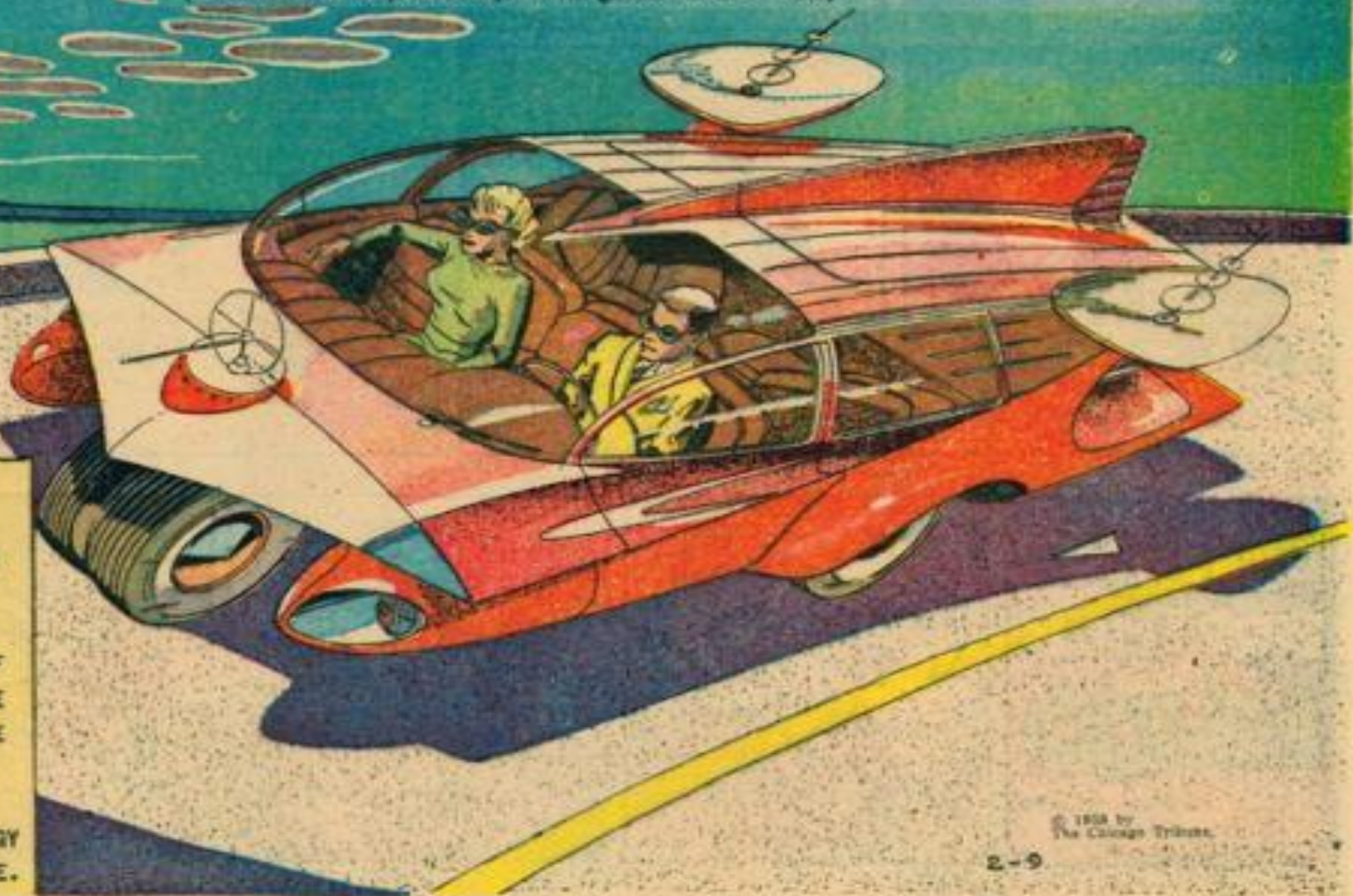
NEWS FLASH!

BULLETIN--SOLAR AUTOMOBILE

DETROIT, FEB. 7--THE AUTOMOBILE INDUSTRY MAY BE PRODUCING CARS DRIVEN BY SOLAR POWER IN THE YEARS AHEAD, JAMES C. ZEDER, CHRYSLER VICE-PRESIDENT, PREDICTED TODAY.

"WE KNOW HOW TO GET ELECTRICAL ENERGY FROM SUNLIGHT BY MEANS OF SILICON CONVERTERS," SAID THE CHRYSLER ENGINEERING EXPERT. "IF WE CONTINUE TO INCREASE THE EFFICIENCY OF THESE CONVERTERS, AND IF WE ARE ABLE TO DEVELOP SMALL, EFFICIENT ENERGY STORAGE CELLS, SOLAR POWERED CARS WILL BE FEASIBLE."

ZEDER ADDED THAT EXPANDING KNOWLEDGE OF NUCLEAR AND SOLAR ENERGY IS "BRINGING INTO SIGHT" MORE ABUNDANT POWER FOR PEOPLE EVERYWHERE.





SOLAR POWERED 
Electric Car Charging Stations

Using solar power to charge your electric vehicle (EV) is a great way to reduce your carbon footprint and save money on electricity. The solar panels on the roof of the charging station generate electricity that is used to charge your vehicle. This means you can charge your EV for free or at a significantly reduced rate compared to other charging stations.

THIS CHARGING STATION FEATURES:

- **Free charging:** Charging is completely free for all EV drivers.
- **Fast charging:** The station can charge your EV at a rate of 240V, which is faster than most public charging stations.
- **24-hour access:** The station is available for use 24 hours a day, 7 days a week.
- **Secure location:** The station is located in a secure, well-lit area with surveillance cameras.
- **Weather protection:** The station is covered by a large solar panel array that protects the car and the charging equipment from the elements.

SDGE and SDGE logo are trademarks of San Diego Gas & Electric Company. © 2015 SDGE. All rights reserved.



1599

SDGE

A Sempria Energy company

Connected to an electric drive
Another SDGE logo on vehicle

Electric drive is beautiful.

SDGE

Simple. The way it should be.

SPEED
LIMIT
5



FR-D FREE RIDE
SAN DIEGO EVERYWHERE DOWNTOWN

**Advertise
Here!**

sales@thefreeride.com



**WANT YOUR BUSINESS
SEEN BY MILLIONS?**

sales@thefreeride.com

**CUSTOM CAMPAIGNS
VIDEO ADS & MORE!**



FR-D FREE RIDE
SAN DIEGO
EVERYWHERE DOWNTOWN

**DITCH THE CAR,
ENJOY THE RIDE**

FR-D
SAN DIEGO
THE FREE RIDE EXPERIENCE

8:41 AM 100% BATT
FR-D
DOWNLOAD THE APP
thefreeride.com/fred

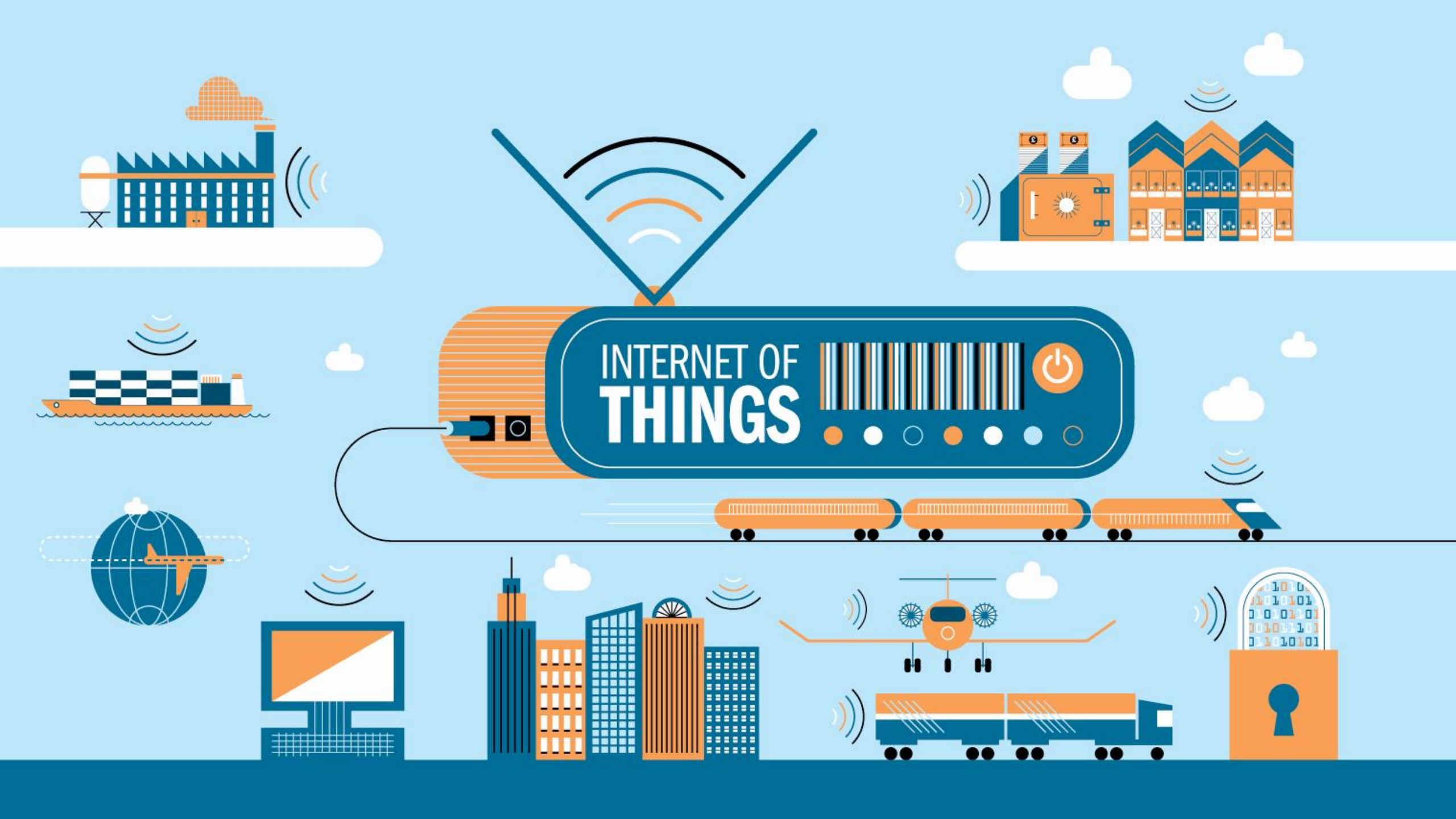
FR-D FREE RIDE

FR-D FREE RIDE
EVERYWHERE DOWNTOWN

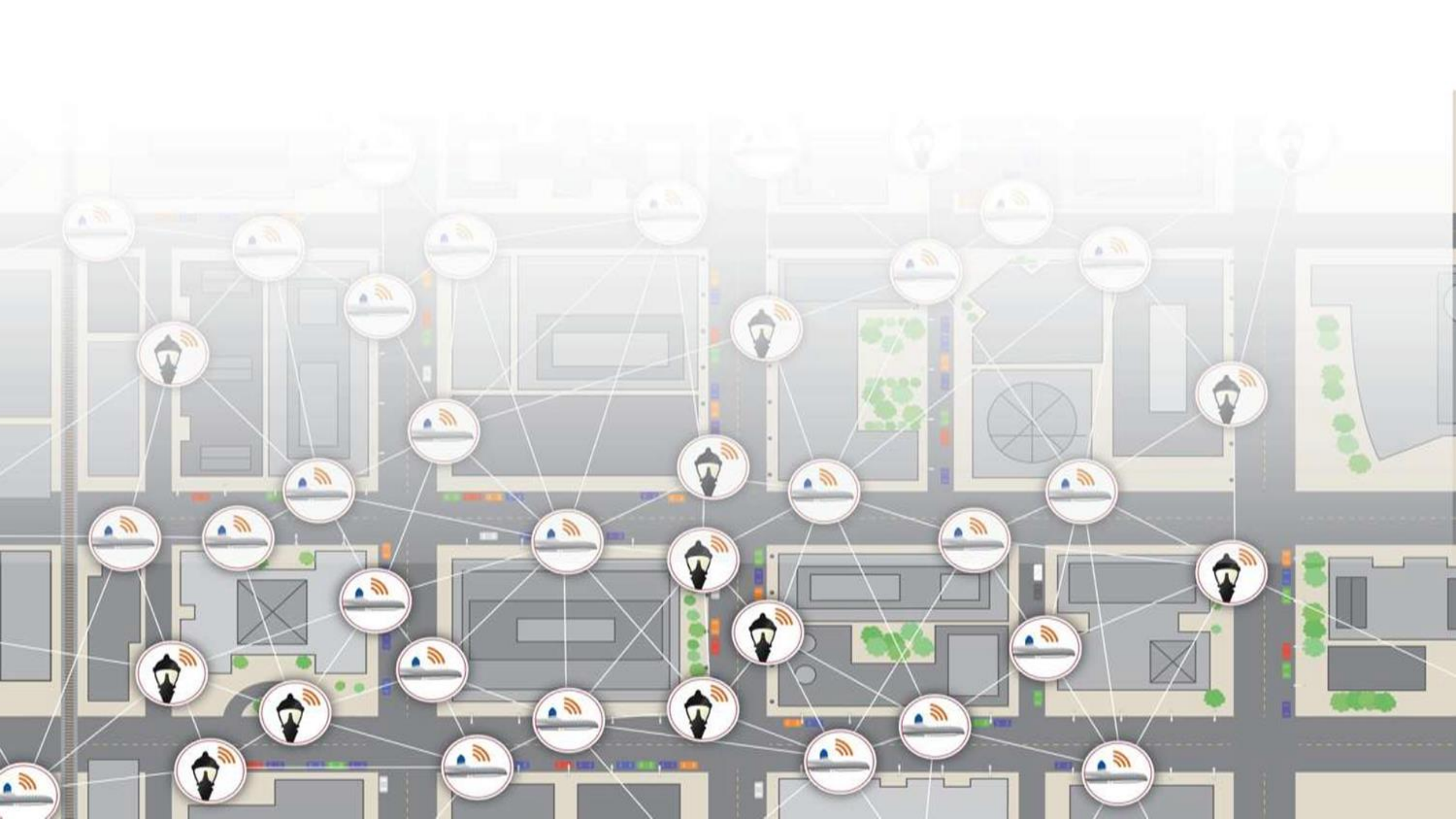
California

10 LEED Certified Buildings
\$1.6 Million in energy efficiency savings











Stone Full Circle Pale Ale



- Brewed with San Diego's "Pure Water"
- Brewed to be refreshingly clean!
- 5.4% ABV, 53 IBUs, Color 21
- Brewed with very generous additions of Riwaka and Wai-Iti hops, pale 2 row malt, malted rye, and wheat malt
- Tropical fruit notes from the New Zealand hops and some nice caramel flavors

Thanks to our sponsors who helped make this event possible!



Learn more about Pure Water San Diego at www.purewatersd.org.



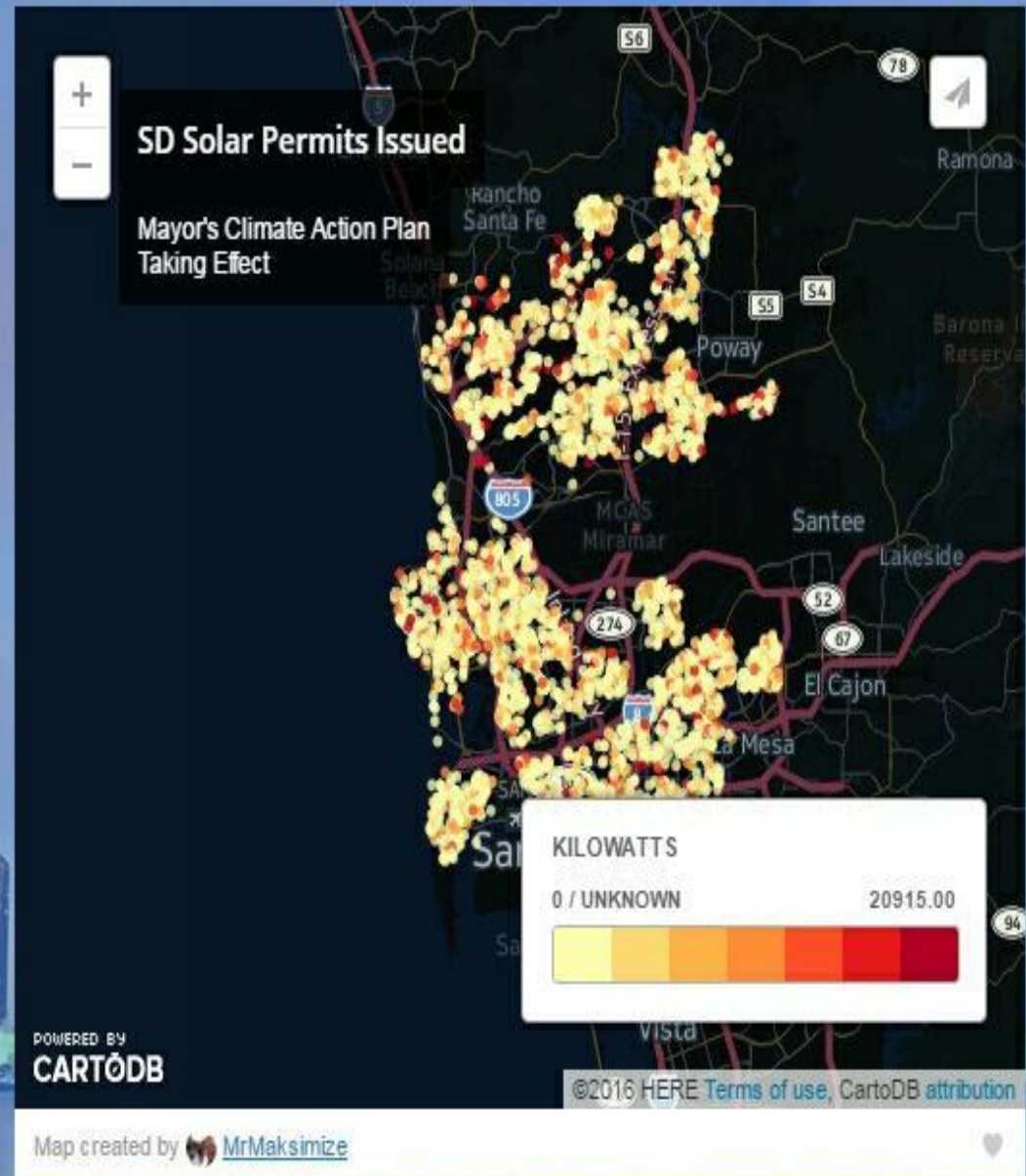
Welcome to the City of San Diego Open Data Portal!

Find and use data about your City government.

Learn more about Open Data in San Diego.

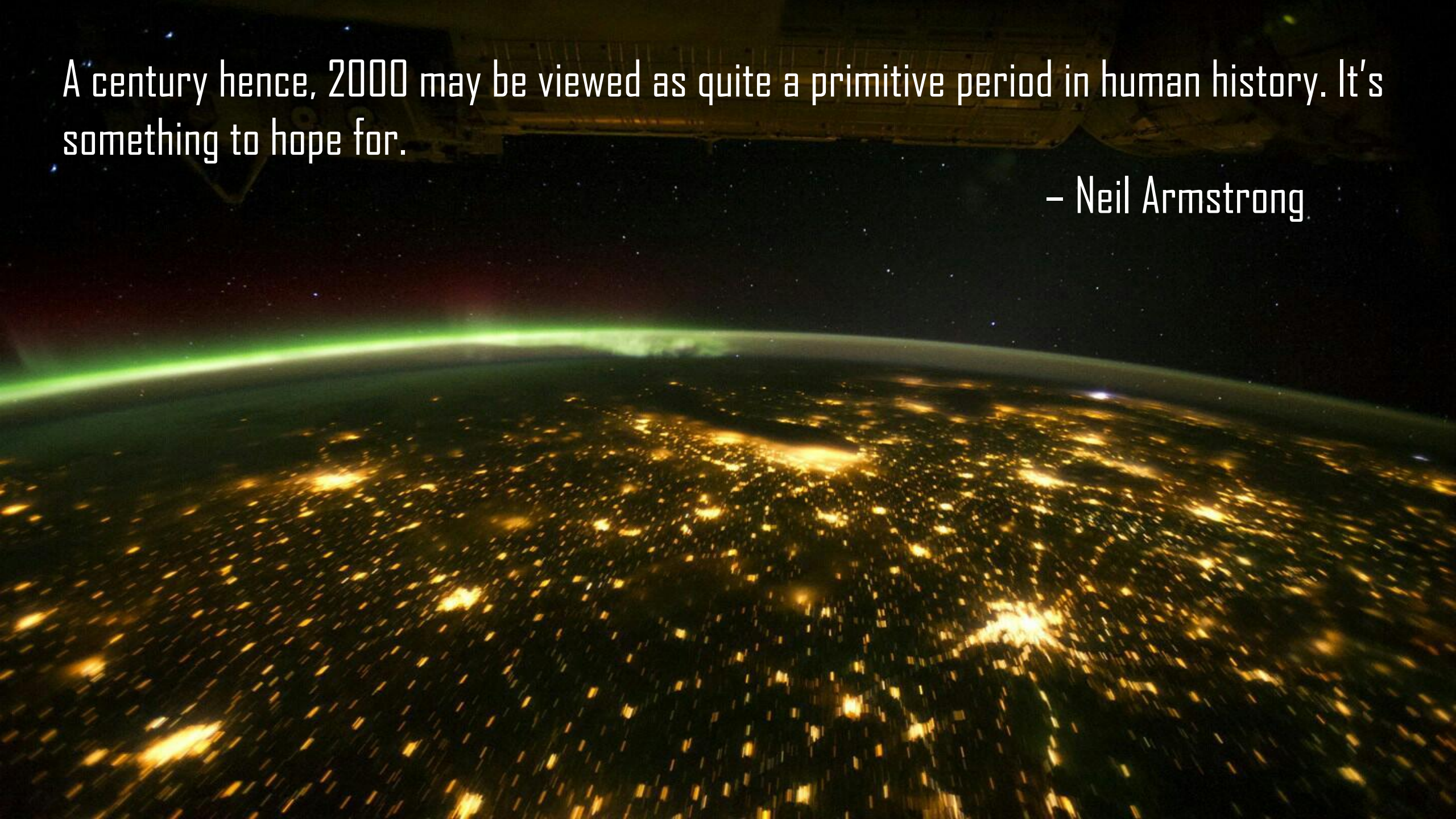
Popular

Map Property Transit



A century hence, 2000 may be viewed as quite a primitive period in human history. It's something to hope for.

– Neil Armstrong

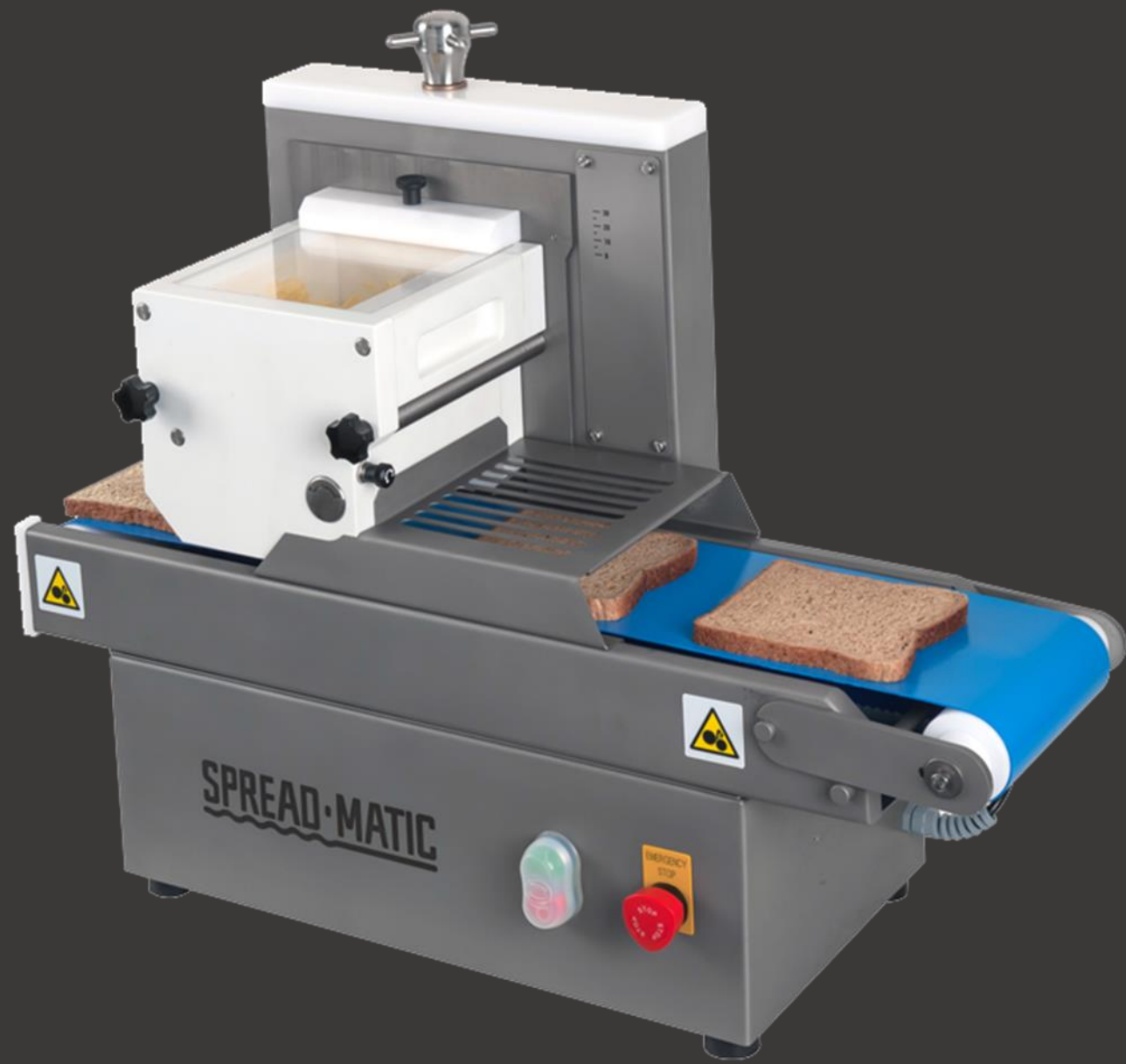




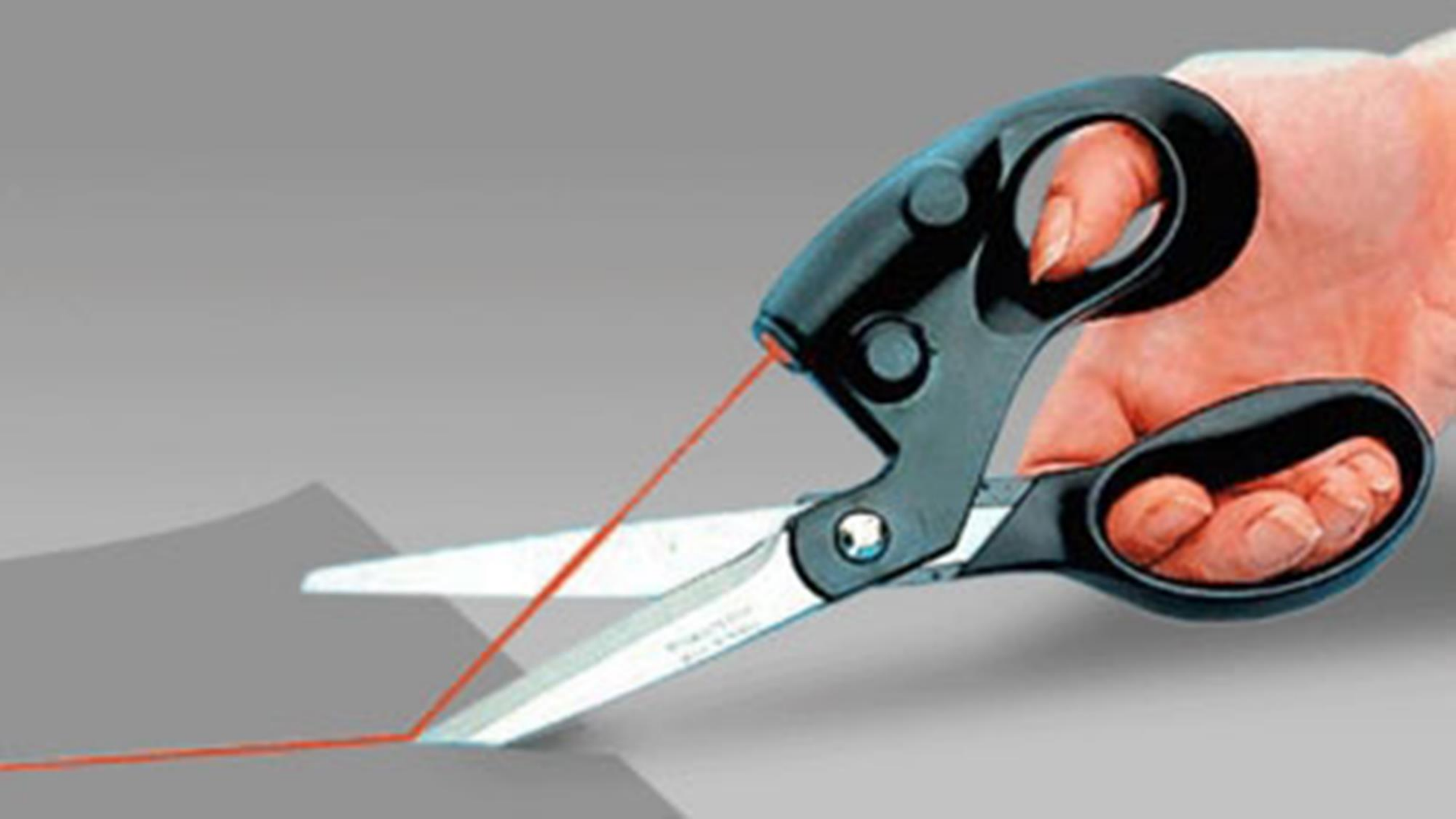
no waste no mess

butter spreader











before



after

“Transforming cities around the world in this way is already a race – one that the United States cannot afford to lose.”



CCIF

CRITICAL CONSUMER
ISSUES FORUM
