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ORIGINAL

**Memorandum**  
From the office of  
**Commissioner Andy Tobin**  
**Arizona Corporation Commission**  
1200 W. WASHINGTON  
PHOENIX, ARIZONA  
(602) 542-3625

TO: Docket Control

DATE: August 4<sup>th</sup>, 2016

FROM: Commissioner Andy Tobin's Office

SUBJECT: Docket No. # E-00000J-16-0257

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Attached please find Steve Scharnhorst presentation entitled "People, Capacity and Generation: The Case for long duration energy storage" for the Reducing System Peak Demand Costs Workshop on August 4, 2016.

Arizona Corporation Commission  
**DOCKETED**

AUG 03 2016

DOCKETED BY	
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## CERTIFICATION OF SERVICE

On this 4th day of August, 2016, the foregoing document was filed with Docket Control as a correspondence from Commissioner Andy Tobin, and copies of the foregoing were mailed on behalf of Commissioner Andy Tobin to the following who have not consented to email service. On this date or as soon as possible thereafter, the Commission's eDocket program will automatically email a link to the foregoing to the following who have consented to email service.

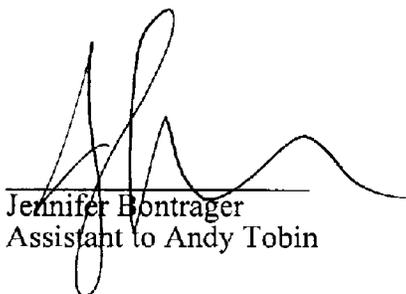
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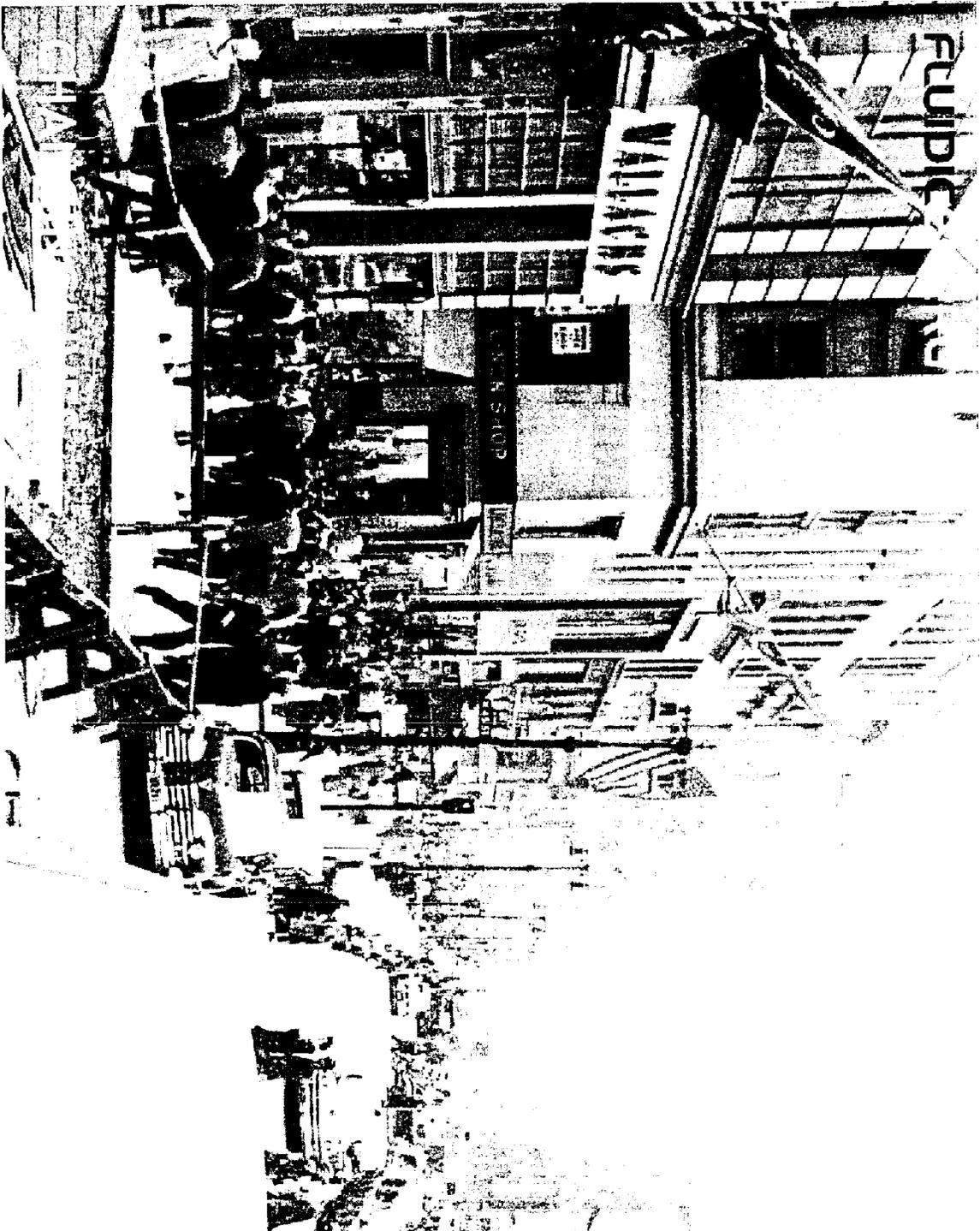
  
\_\_\_\_\_  
Jennifer Bontrager  
Assistant to Andy Tobin

AUDICENERGY

People's

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## PROPERTY

1950

2.5B global population

PHOENIX

Population 400,000

1.5 million people in the top

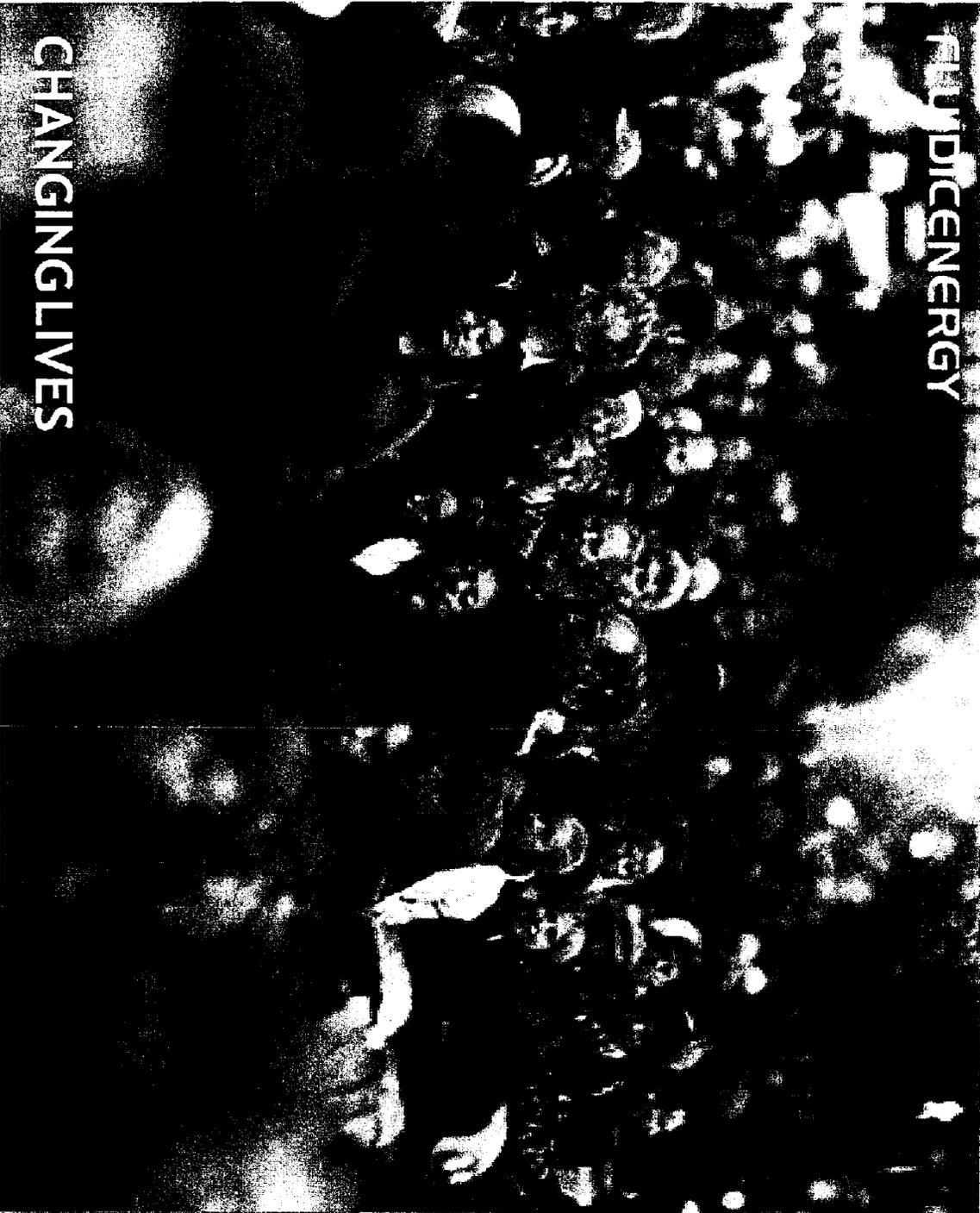
100 cities in the USA

at 7/99

Stable Grid

Stable Demand

Stable Market



HYDROENERGY

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## PEOPLE

Today

- 7.5B globally
- 10B expected by 2050

Phoenix today:

- Population 1.6M
- 6th largest city in USA
- 15X growth within a generation

Overtaxed Grid

New User Devices

Growing Dependence



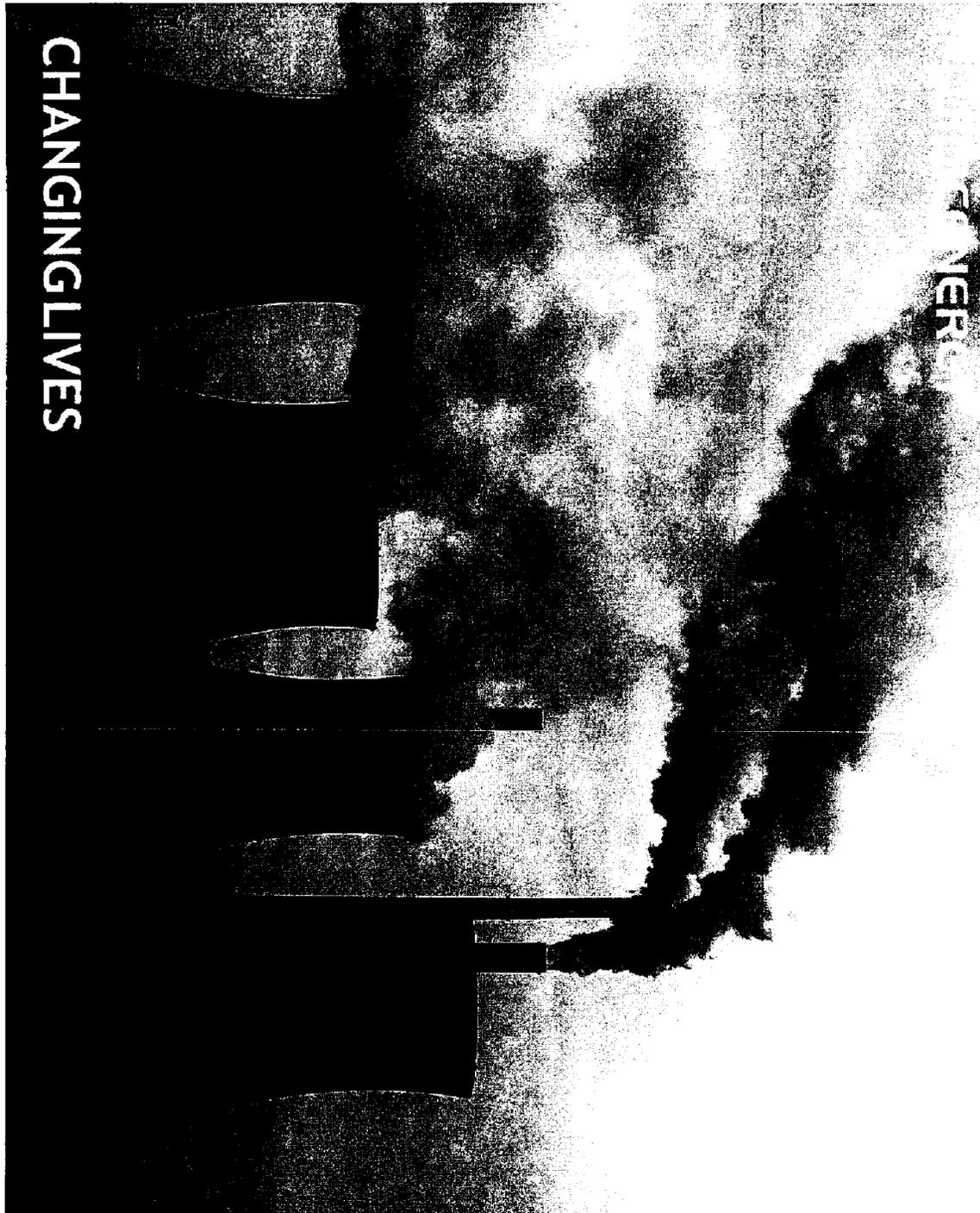
FLUIDIC ENERGY

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ENERGY

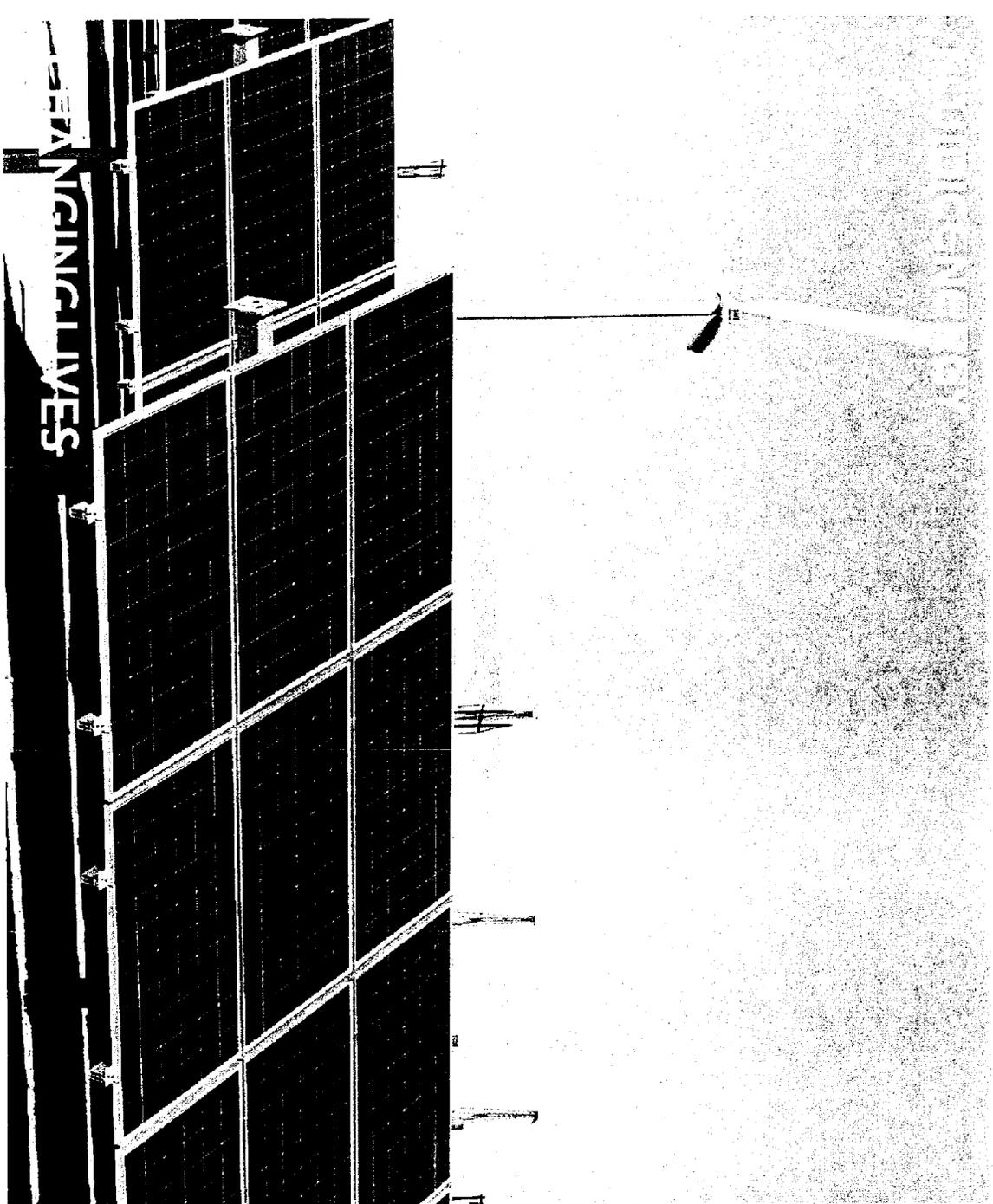
## GENERATION

- The grid became the grid in 1920 to help local utilities manage peak loads
- Simply put a 13X increase in demand has not been met with a 13X increase in supply

Short term energy storage is a bridge for UPS, and DG ramp up.

Short Term Energy Storage can act as a bridge for demand shift.

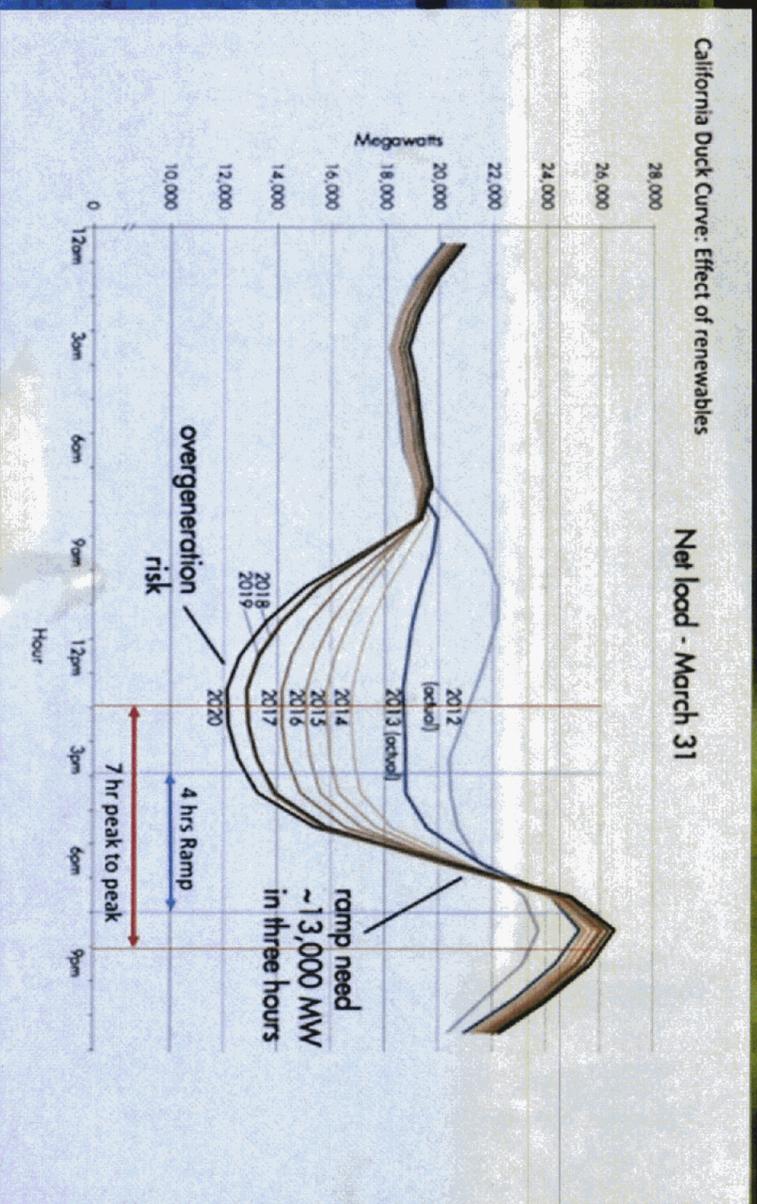
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BEHINDING LIVES

## GENERATION

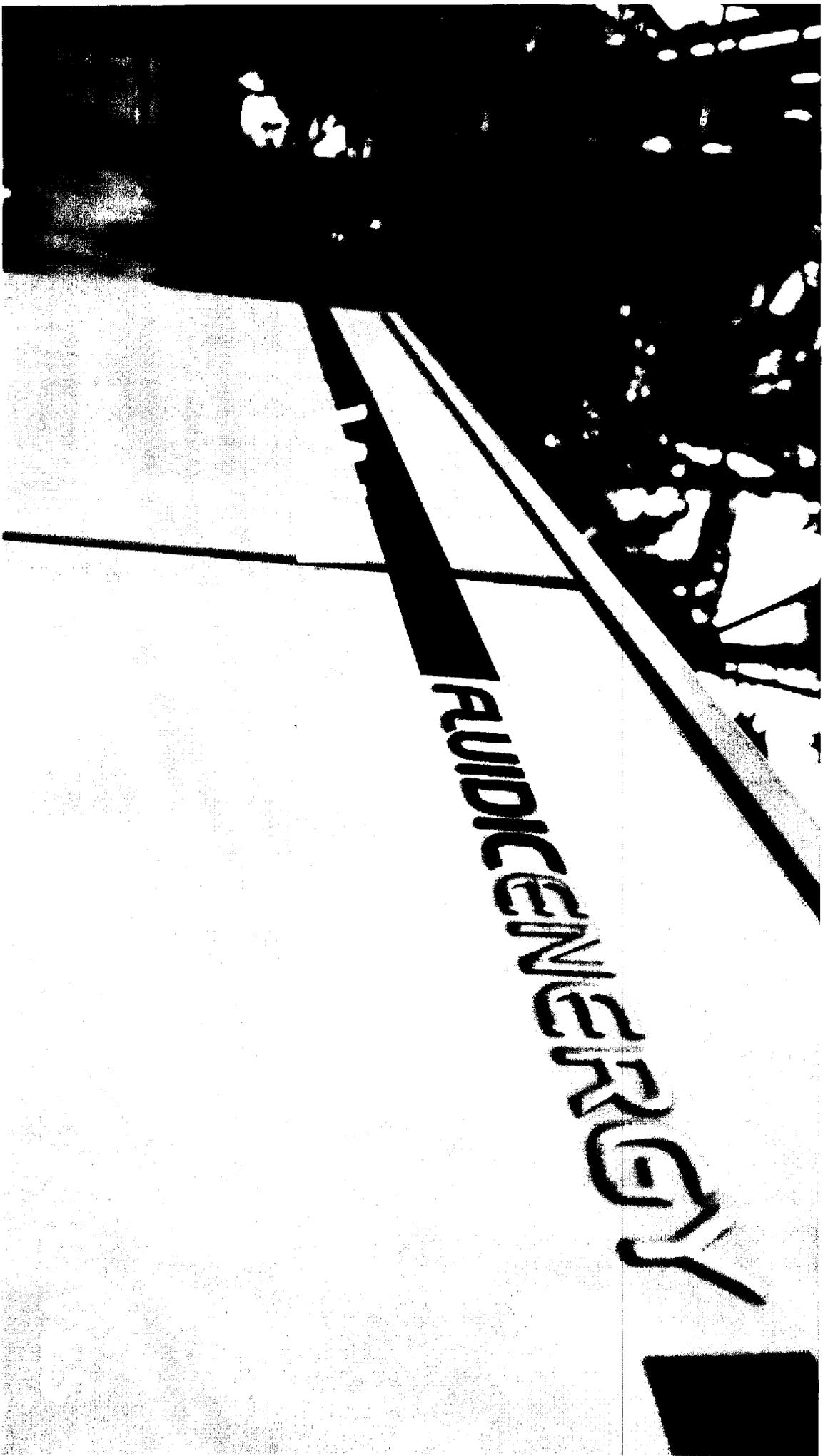
- Renewables: help and hinder
- Demand management: one part of the solution
- Energy storage, a few hours is not enough, lithium is great but not the answer
- We need to balance off peak and solar peak production to meet times of demand
- We need long duration energy storage



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People, Capacity,  
Generation

- Overall demand will continue to grow
- Renewable penetration drives intermittency as well as over generation issues
  - Calif Example: 50% renewables by 2030
- Ramping conventional generation is expensive
- Peak to Peak times will move from 2-4 hours to 8+ hours



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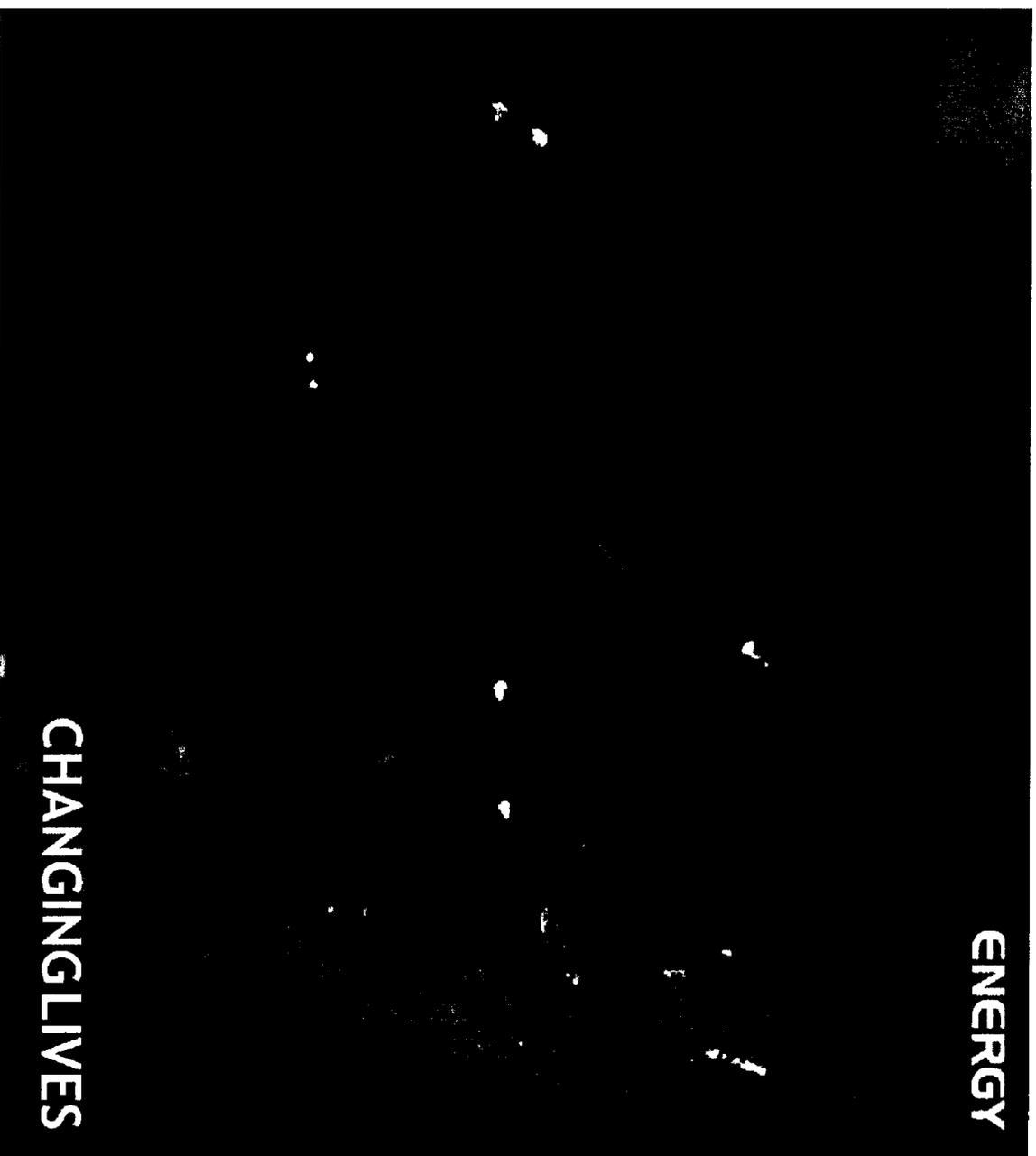
Zinc Energy storage is nothing new, it has been around for more than a hundred years. We use it everyday in the AAA batteries we find at work and at home.

So what makes Fluidic Energy New?

We are the first company to have successful made Zinc Air batteries commercially rechargeable.

Which we, along with the US Department of Energy, several Sovereign States and multiple Fortune 500 customers think is a really big deal.

But Why?



FLUIDICENERGY



5X

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# LOWER COST

The company was founded with an big audacious goal; to invent and commercialize the lowest cost means of energy storage. How do we do that?

Simple.

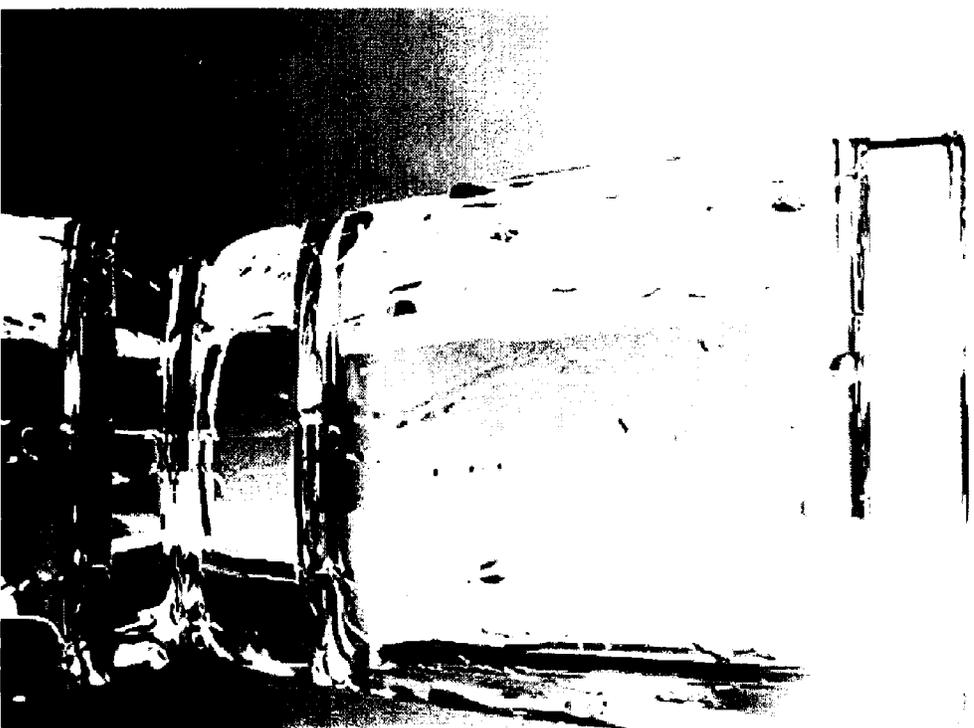
- Our Cathode is the air we breath
- Our Electrolyte is primarily water
- Our Anode is zinc: 15X lower cost than Lithium and 5X lower cost than lead, on a raw material basis
- Our manufacturing startup costs are low, 1/20<sup>th</sup> of what it would cost for a comparable lithium ion manufacturing plant

Placing us on a path to surpass current industry benchmarks.

# SAFE

Because our cells active components are air, water and zinc our batteries are fundamentally safe with no thermal runaway, no gassing and no toxic materials. Pure, clean, simple.

FLUIDIC



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# FLUIDICENERGY

FLUIDICIQ™

Account

Fleet

Reports

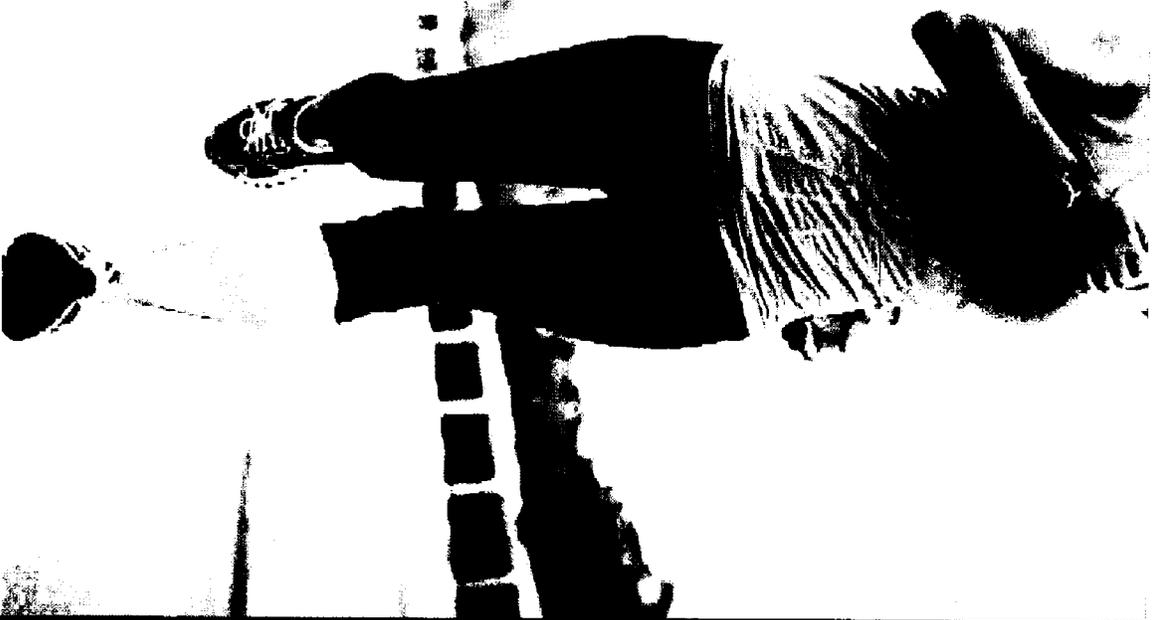


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# INTELLIGENT

- Fluidic IQ enables renewable energy storage to reach its full potential.
- Each fluidic cell provides a heartbeat signal communicating state of health data every 60 seconds on a 24/7 basis to Fluidics Network Operation Centre
- This data is monitored and analyzed providing a host of diagnostic and business intelligence functions
- Each system is capable of remote control and maintenance functions
- Maximizing usage, minimizing down time, reducing maintenance costs and enabling the intelligent use of renewable energy

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# LONG DURATION

Unfortunately renewable energy is not dependable or dis-patchable.

If we are to harness its potential we need an energy storage solution that can provide energy not just 4 hours but 8, 24 and 48 hours of supply.

Zinc air is that Long Duration solution.

Its simple: its not effected by states of charge, it doesn't suffer from cell balancing scaling issues, its not reliant on mechanical pumps and its energy and power characteristics can be decoupled.

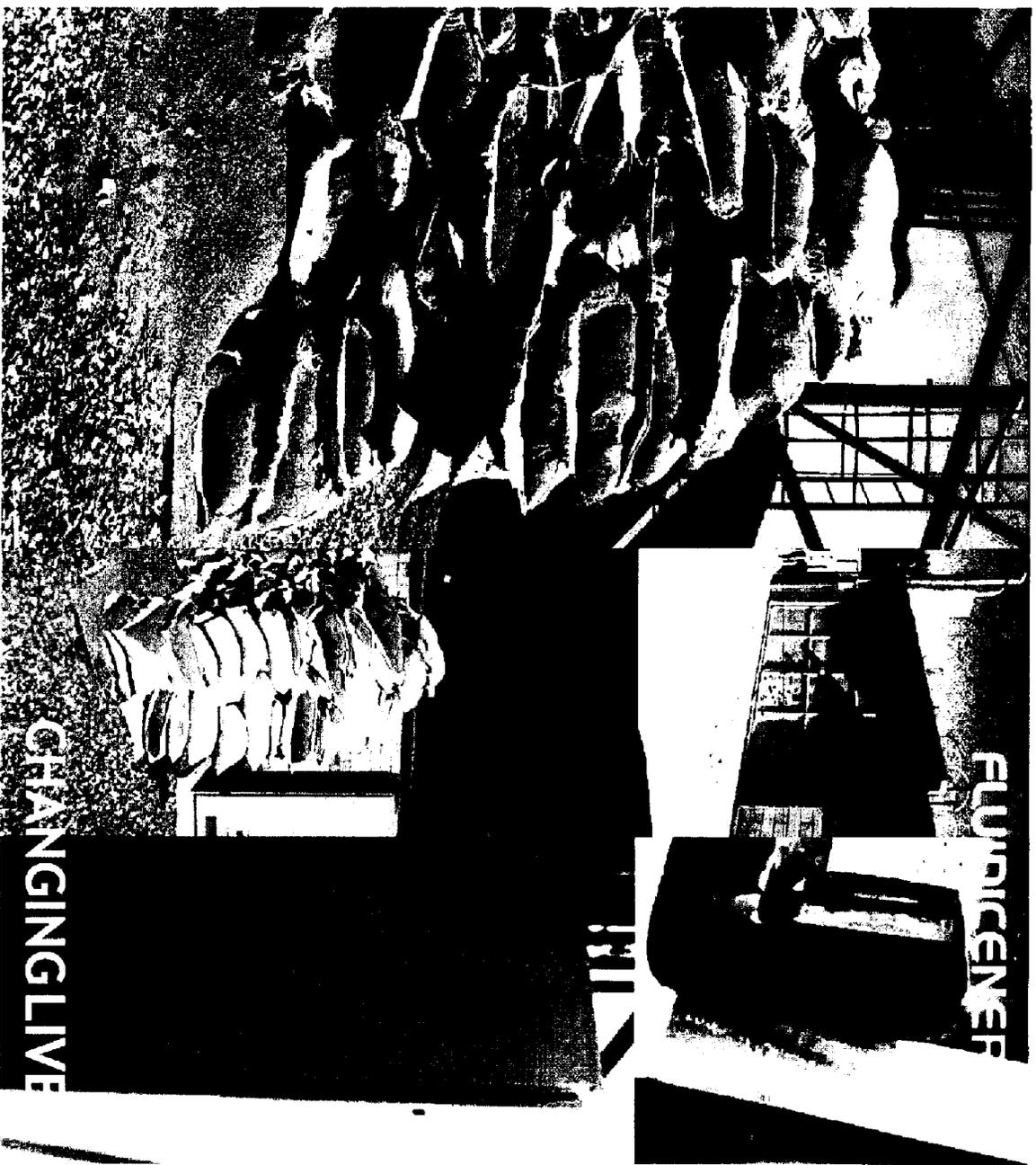
In fact the longer the duration the lower the cost per KWh.

CHANGING

With more than 75,000 batteries in 1,200 locations around the world, Fluidic Energy is quickly establishing itself as an energy storage solutions leader.

Our systems have survived extreme heat, humidity, monsoons, cyclones and the occasional hail of bullets.

Despite this we continue to maintain a 100% service level agreement record with our customers. Exceeding their expectations for uptime, service and reliability, that's what we call Proven.



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CHANGING WAVES