



@ SECOR

FOWD 2014

THE WEB IS INEFFICIENT BUT WE CAN FIX IT

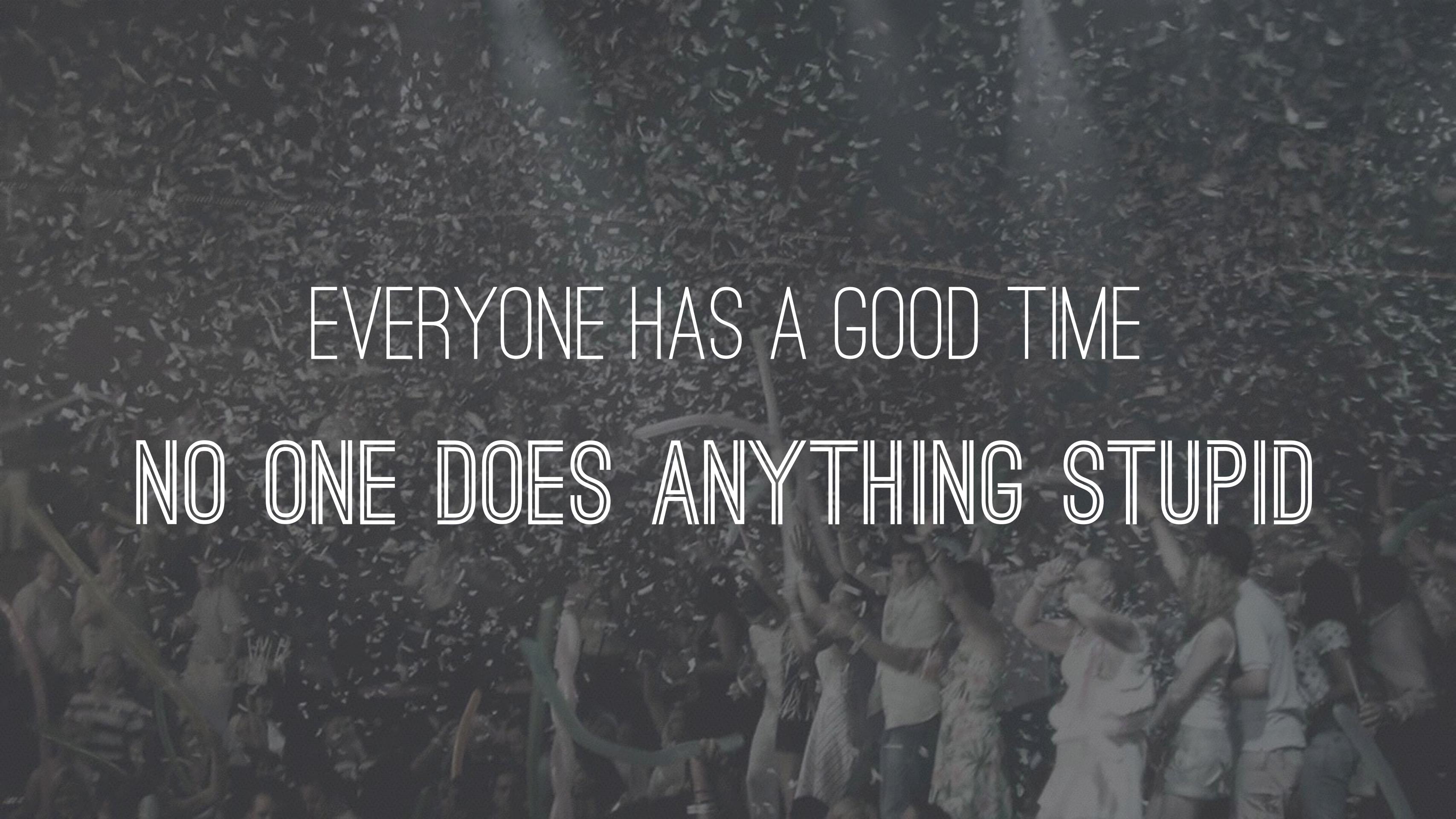






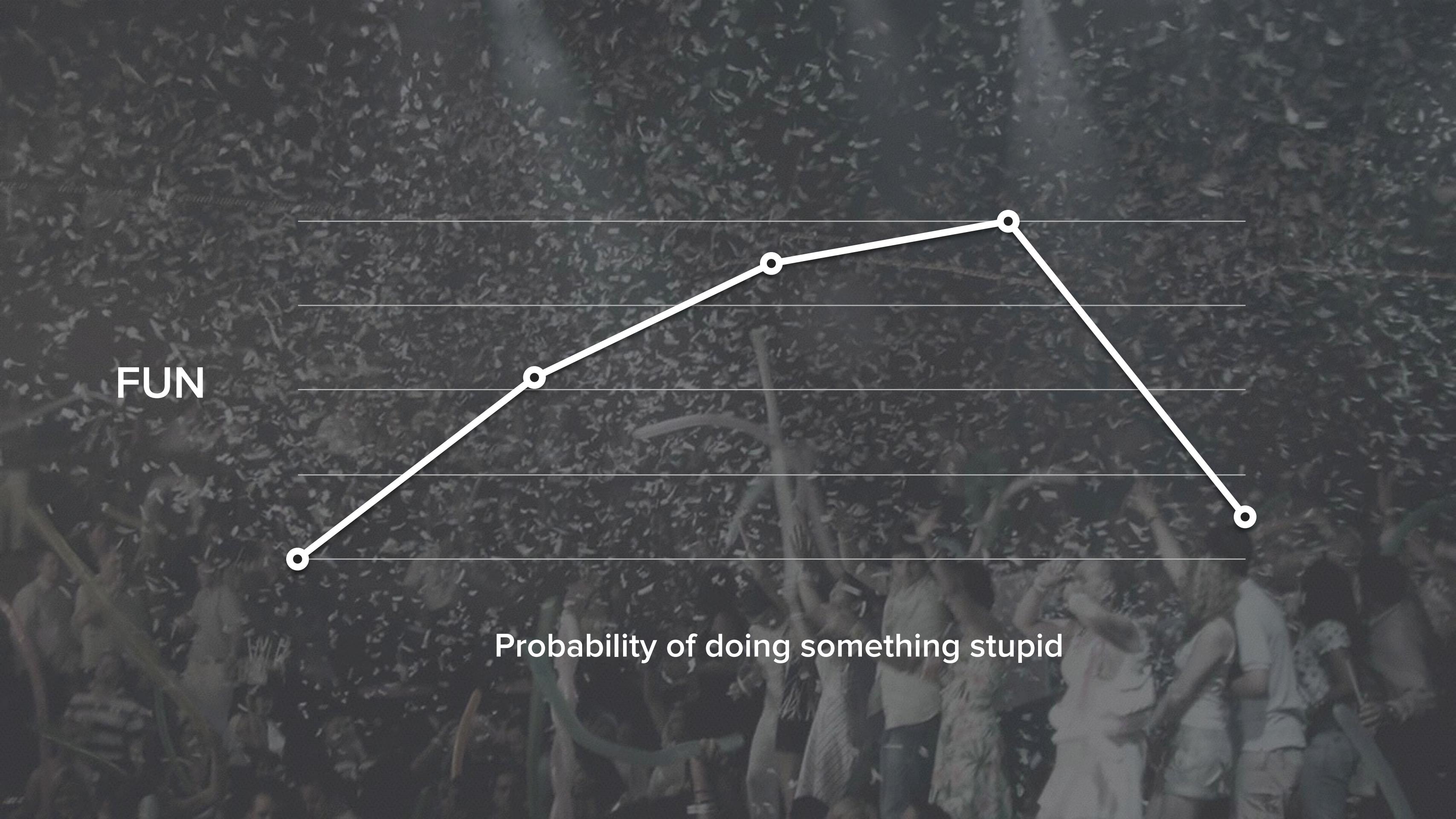
A dark, grainy photograph capturing a festive scene. In the foreground, several people are visible, some wearing patterned shirts and hats. A large amount of white confetti is falling from above, creating a sense of motion and celebration. The background is dark and indistinct, suggesting a night-time event.

EVERYONE HAS A GOOD TIME



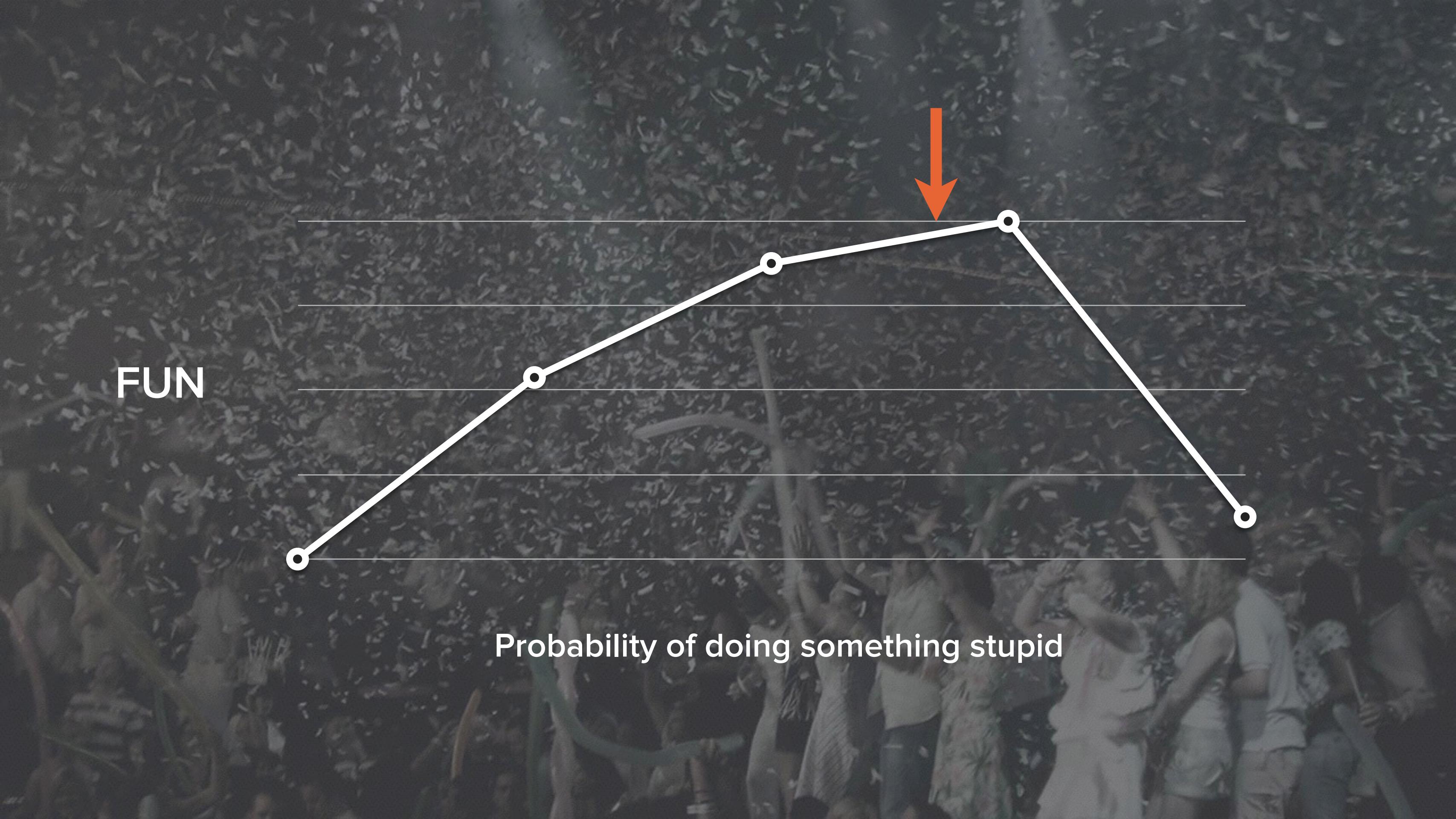
EVERYONE HAS A GOOD TIME
NO ONE DOES ANYTHING STUPID





FUN

Probability of doing something stupid



FUN

Probability of doing something stupid











“Yeah, it felt wong.”



thisFeelsWong

FOWD

HIDDEN RESPONSIBILITIES



GOOD
BAU
NEWS

THE WEB IS
ENERGY

INEFFICIENT

THE WEB IS
A MASSIVE
SUCK

WHOOPS

FUTURE
OF
WEB
DESIGN



photo by Randy Davis

THE WEB IS
ENERGY

INEFFICIENT

WE CAN

FIX

IT



THE INTERNET

A series of tubes.

DATA CENTERS

76

BILLION

KWH / YEAR

x²







DOWNLOADS

From BBC News

How do you solve a problem like Googoosha?

A year ago, the daughter of Uzbek president Islam Karimov was riding high - but in the last 12 months it has all gone very wrong. Can she bounce back, asks Natalia Antolova?

**News**[Syria chemical arms transport](#)[Actress sues over Hollande 'affair'](#)

The actress linked to French President François Hollande, Julie Gayet, sues the

'Google Glass driver' in US court

[New video 'shows captive US soldier'](#)

UN confronts Vatican on child abuse

[East German's prize 45](#)**Culture: Sundance**[Ten films to look for at Sundance](#)

From last-minute additions to anticipated releases, these are the films that should be on everyone's radar.

Travel: Living In

From BBC News

How do you solve a problem like Googoosha?

A year ago, the daughter of Uzbek president Islam Karimov was riding high - but in the last 12 months it has all gone very wrong. Can she bounce back, asks Natalia Antolova?

**News****Syria chemical arms transport****Actress sues over Hollande 'affair'**

The actress linked to French President François Hollande, Julie Gayet, sues the

'Google Glass driver' in US court

New video 'shows captive US soldier'

UN confronts Vatican on child abuse

East German's prize 45**Culture: Sundance****Ten films to look for at Sundance**

From last-minute additions to anticipated releases, these are the films that should be on everyone's radar.

Travel: Living In

1.7MB 64 MILLION/MONTH

1 BIT =

4.6 MICROJOULES

From BBC News

How do you solve a problem like Googoosha?

A year ago, the daughter of Uzbek president Islam Karimov was riding high - but in the last 12 months it has all gone very wrong. Can she bounce back, asks Natalia Antolova?



Culture: Sundance

**Ten films to look for at Sundance**

From last-minute additions to anticipated releases, these are the films that should be on everyone's radar.

News

**Syria chemical arms transport****Actress sues over Hollande 'affair'**

The actress linked to French President François Hollande, Julie Gayet, sues the

'Google Glass driver' in US court

New video 'shows captive US soldier'

UN confronts Vatican on child abuse

East German's prize 45

Travel: Living In



$$1.7 \text{ megabytes} = 14.26 \times 10^6 \text{ bits}$$

$$14.26 \times 10^6 \text{ (bits)} * 4.6 \times 10^{-6} \text{ (joules per bit)} = 65.596 \text{ joules}$$

$$65.596 * 32,000,000 \text{ (site traffic / 2)} = 2,099,072,000 \text{ joules} = 583 \text{ kWh}$$

From BBC News

How do you solve a problem like Googoosha?

A year ago, the daughter of Uzbek president Islam Karimov was riding high - but in the last 12 months it has all gone very wrong. Can she bounce back, asks Natalia Antolova?

**News**[Syria chemical arms transport](#)[Actress sues over Hollande 'affair'](#)

The actress linked to French President François Hollande, Julie Gayet, sues the

'Google Glass driver' in US court

[New video 'shows captive US soldier'](#)

UN confronts Vatican on child abuse

[East German's prize 45](#)**Culture: Sundance**[Ten films to look for at Sundance](#)

From last-minute additions to anticipated releases, these are the films that should be on everyone's radar.

Travel: Living In

From BBC News

How do you solve a problem like Googoosha?

A year ago, the daughter of Uzbek president Islam Karimov was riding high - but in the last 12 months it has all gone very wrong. Can she bounce back, asks Natalia Antolova?

**News**[Syria chemical arms transport](#)[Actress sues over Hollande 'affair'](#)

The actress linked to French President François Hollande, Julie Gayet, sues the

'Google Glass driver' in US court

[New video 'shows captive US soldier'](#)

UN confronts Vatican on child abuse

[East German's prize 45](#)**Culture: Sundance**[Ten films to look for at Sundance](#)

From last-minute additions to anticipated releases, these are the films that should be on everyone's radar.

Travel: Living In

583 KWH

1 KWH =

1.1 POUNDS OF COAL

641

POUNDS
COAL

641

POUNDS

COAL

1,202

POUNDS

CO₂



DEVICES

THE IPHONE 6

3.8 KWH

3.8 KWH

91,000,000

3.8 KWH

91,000,000

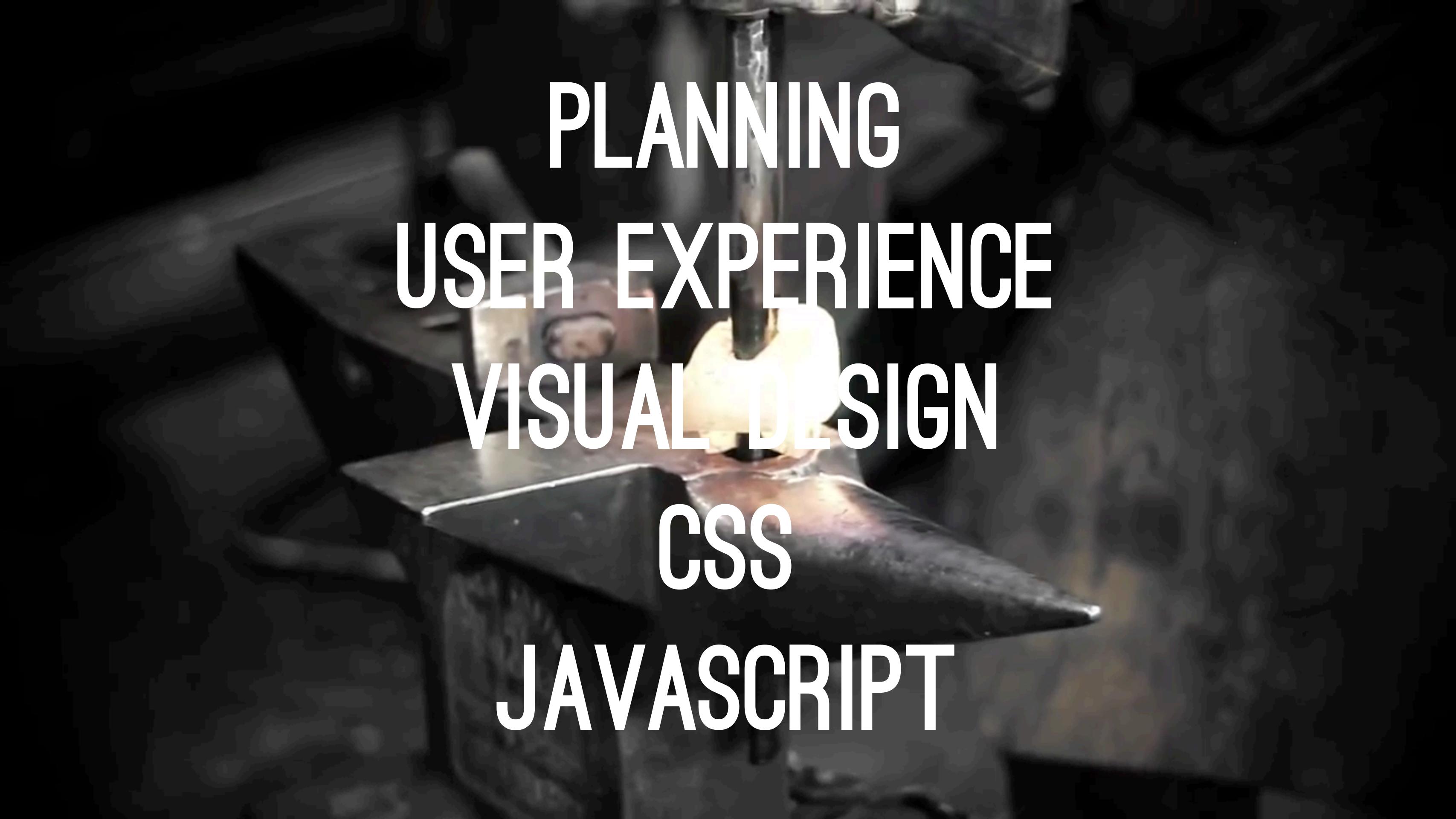
345,800,000 KWH



READY?

LET'S GET TO WORK.



A close-up, low-angle shot of a person's hands working on a piece of wood. A metal chisel is held vertically, positioned as if it's about to strike or has just struck a mark on the wood. The wood shows some grain and texture. The background is dark and out of focus.

PLANNING
USER EXPERIENCE
VISUAL DESIGN

CSS
JAVASCRIPT

PLANNING

PLANNING

ENERGY EFFICIENCY
=
SUCCESS





PLANNING

PLANNING

FAST

=

ENERGY EFFICIENT

PLANNING

PLANNING

STATIC SITE GENERATORS

PLANNING

STATIC SITE GENERATORS
SHITLOADS OF CACHING

PLANNING

STATIC SITE GENERATORS

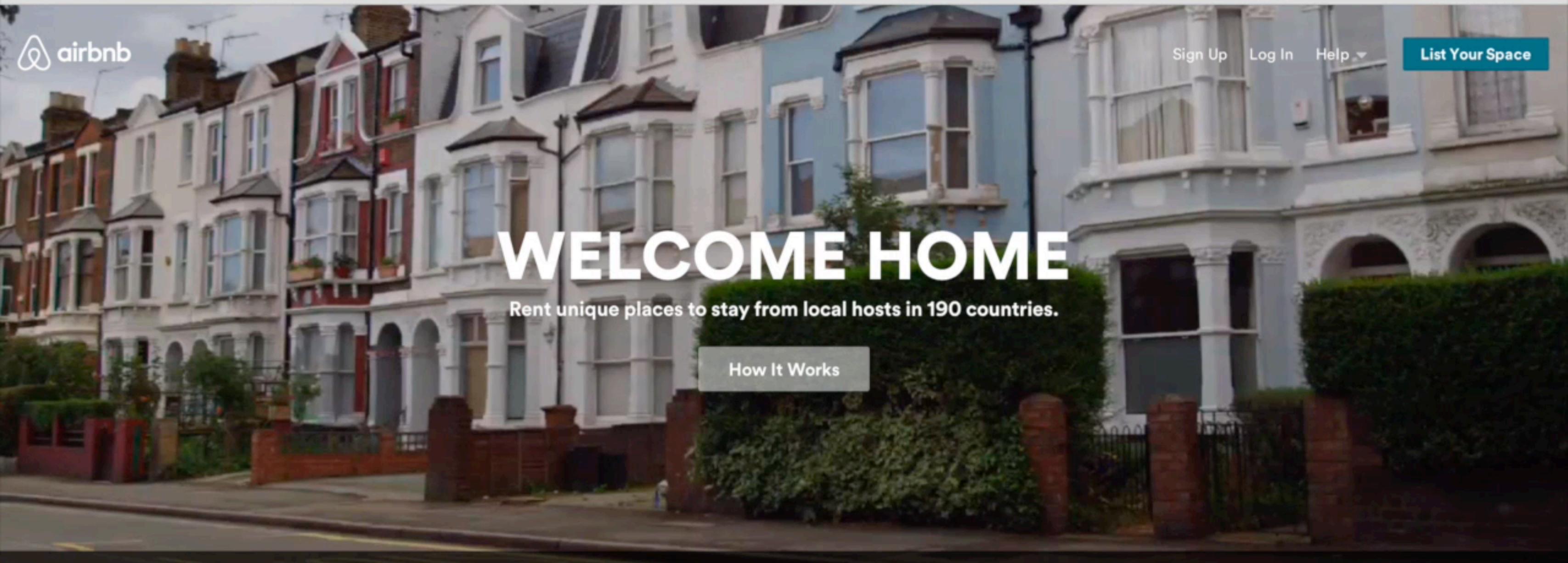
SHITLOADS OF CACHING

BACK END
LOCAL STORAGE

UX

UX

STOP DESIGNING PAGES



WELCOME HOME

Rent unique places to stay from local hosts in 190 countries

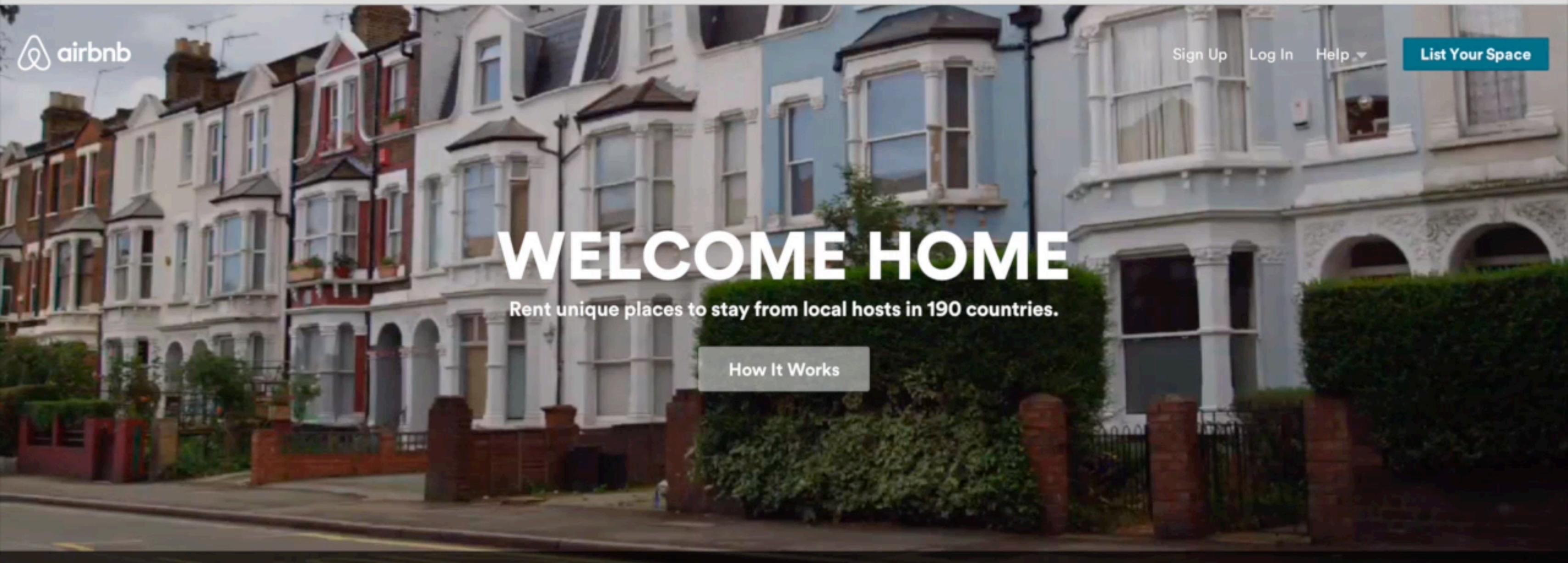
How It Works

san f	Check In	Check Out	1 Guest	Search
-------	----------	-----------	---------	---------------

- San Francisco CA, United States
 - San Jose CA, United States
 - San Mateo CA, United States
 - San Leandro CA, United States
 - San Rafael CA, United States

It's time to get ready for the Weekend!

new, inspiring places close to home



WELCOME HOME

Rent unique places to stay from local hosts in 190 countries

How It Works

san f Check In Check Out 1 Guest ▾ Search

- San Francisco CA, United States
 - San Jose CA, United States
 - San Mateo CA, United States
 - San Leandro CA, United States
 - San Rafael CA, United States

It's time to get ready for the Weekend!

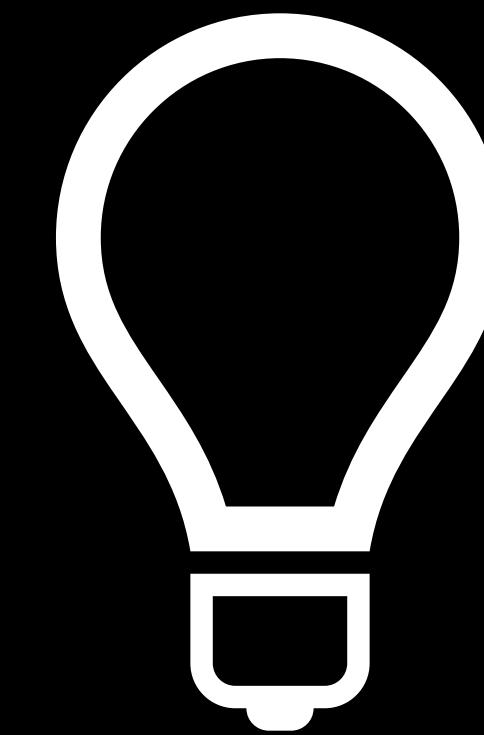
new, inspiring places close to home

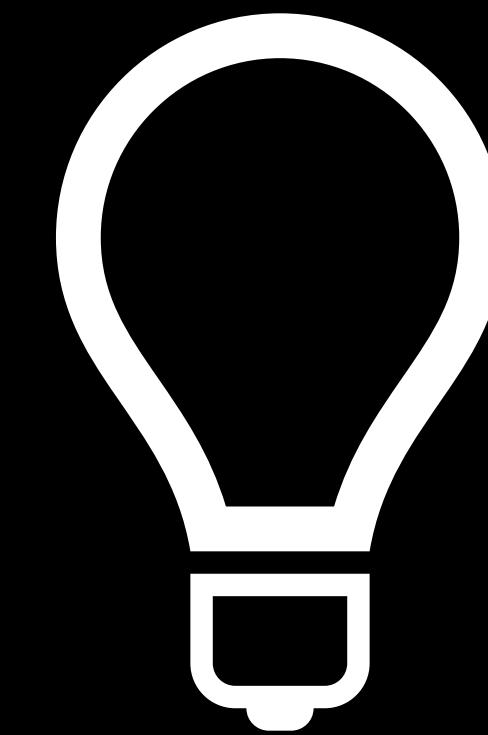
VISUAL DESIGN

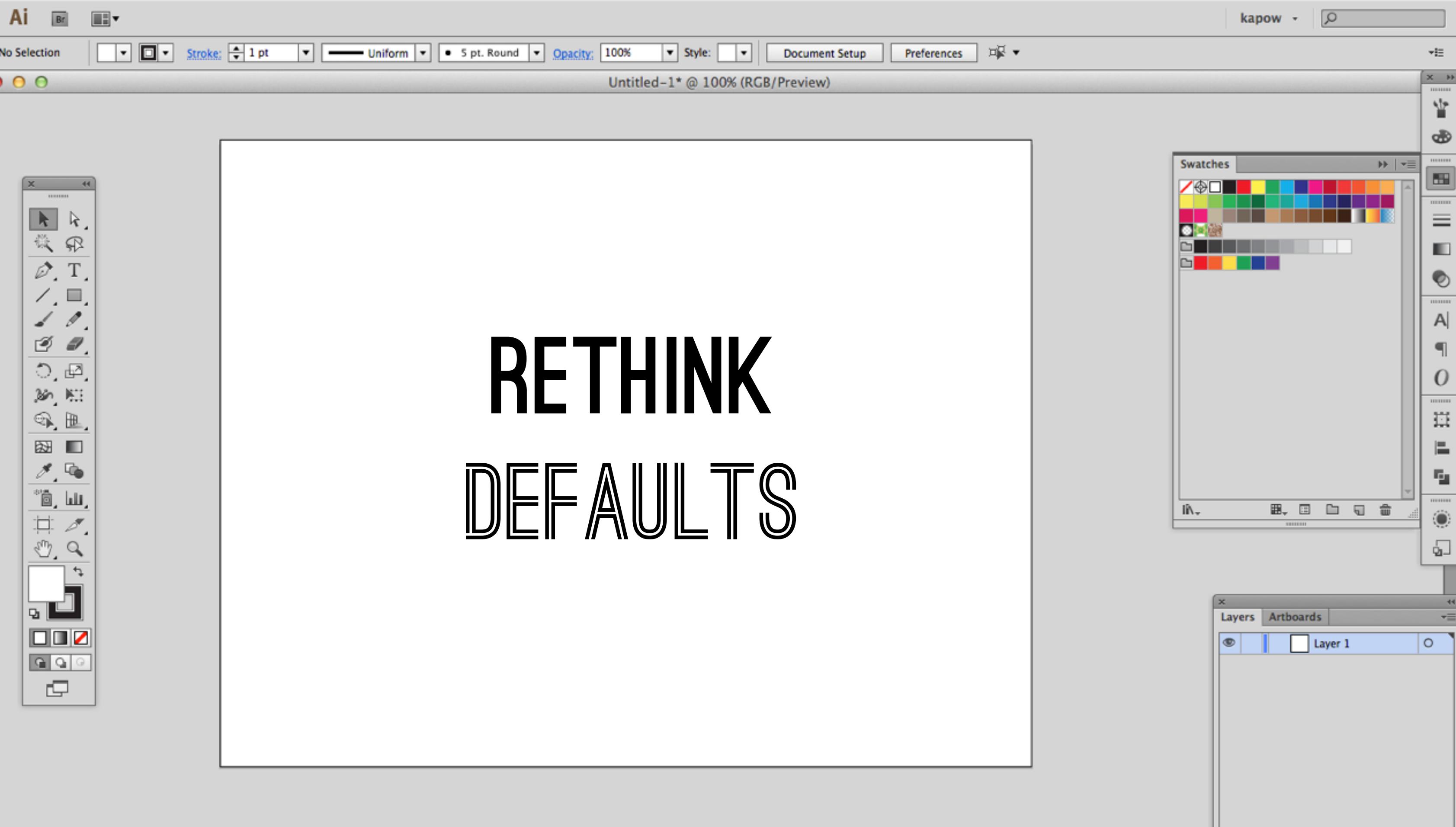
VISUAL DESIGN

KNOW DISPLAYS









CSS

CSS

(OBVIOUS)

CSS

(OBVIOUS)

(NOT-SO OBVIOUS)

CSS

CSS



PREPROCESS

CSS

✓ PREPROCESS

✗ @IMPORT

CSS

✓ PREPROCESS

✗ @IMPORT

✓ MINIFY

CSS

CSS

LIMIT REFLOWS



COMPLEXITY
COMPLEXITY
COMPLEXITY
COMPLEXITY

INC E P T || O N RULE

CSS

CSS

LIMIT REPANTS





CSS

CSS

HARDWARE ACCELERATION

TRANSFORM: `TRANSLATE3D()`

DRAWING WITH CANVAS

DRAWING WITH WEBGL

transform: translate3d(0,0,0)

transform: translate3d(0,0,0)

```
* {  
    transform: translate3d(0,0,0);  
}
```

transform: translate3d(0,0,0)

```
* {  
    transform: translate3d(0,0,0);  
}
```


JAVASCRIPT

JAVASCRIPT

LOW-HANGING FRUIT

```
1 <!DOCTYPE html>
2 <html <?php language_attributes(); ?>>
3   <head>
4     <meta charset="<?php bloginfo( 'charset' ); ?>" />
5     <title><?php wp_title(); ?></title>
6     <link rel="profile" href="http://gmpg.org/xfn/11" />
7     <link rel="stylesheet" href="<?php echo get_stylesheet_uri(); ?>" type=
8       text/css" media="screen" />
9     <link rel="pingback" href="<?php bloginfo( 'pingback_url' ); ?>" />
10    <?php wp_head(); ?>
11  </head>
```

```
1 <!DOCTYPE html>
2 <html <?php language_attributes(); ?>>
3   <head>
4     <meta charset="<?php bloginfo( 'charset' ); ?>" />
5     <title><?php wp_title(); ?></title>
6     <link rel="profile" href="http://gmpg.org/xfn/11" />
7     <link rel="stylesheet" href="<?php echo get_stylesheet_uri(); ?>" type="text/css" media="screen" />
8     <link rel="pingback" href="<?php bloginfo( 'pingback_url' ); ?>" />
9
10    <!--scripts-->
11    <script src="js/vendor/jquery.js"></script>
12    <script src="js/vendor/ui.jquery.js"></script>
13    <script src="js/vendor/modernizr.js"></script>
14    <script src="js/vendor/raphael.js"></script>
15    <script src="js/vendor/swipe.js"></script>
16    <script src="js/app.js"></script>
17
18    <?php wp_head(); ?>
19  </head>
```


JQUERY = 84 KB

3.4 JOULES

10,000 OF US

10,000 OF US

100 PAGES EACH

10,000 OF US

100 PAGES EACH

10,000 VIEWERS

10,000 OF US

100 PAGES EACH

10,000 VIEWERS

APPROX. 10,000 KWH



FUTURE

WEARABLES

WEARABLES

FORGET BATTERIES

WEARABLES

WEARABLES

THERMOELECTRIC

WEARABLES

THERMOELECTRIC
PHOTOVOLTAICS

WEARABLES

THERMOELECTRIC
PHOTOVOLTAICS
PIEZOELECTRIC

OTHER SOURCES OF ENERGY:

OTHER SOURCES OF ENERGY:

RADIO WAVES

RECTENNA

OTHER SOURCES OF ENERGY:

RADIO WAVES

RECTENNA

EM RADIATION

NANTENNA

OP@POWER

OP@POWER

HIDDEN RESPONSIBILITIES





THANKS!

Justin Secor, Senior Designer/Developer at Opower

justinsecor.com

@secor