



Mr. Jonathan McMahon CEO  
AUREON ENERGY LTD  
118 Vista del Mar #3  
Pismo Beach, CA 93449

11 June 2020

Honorable Dan Brouillette  
Secretary of Energy

Dr. Rita Baranwal  
Assistant Secretary for Office of Nuclear Energy

United States Department of Energy  
1000 Independence Ave. SW  
Washington DC 20585  
202-586-5000

**Subject: Letter of Intent (LOI) – SAFIRE Reactor Project**

**Reference: Advanced Reactor Demonstration Program (ARDP)  
Funding Opportunity Number: DE-FOA-0002271**

Dear Honorable Mr. Brouillette / Dr. Baranwal:

Aureon Energy Limited is please to submit this LOI in response to the referenced Funding Opportunity Announcement (FOA) of May 14, 2020.

The attached presentation sets forth for consideration all salient aspects and ongoing accomplishments of the SAFIRE Reactor Project. Please note that a working reactor is already in operation; indeed SAFIRE is already in the commercial development phase:

SAFIRE is available for demonstration to the DOE Office of Nuclear Energy, and for the purposes of the Reference, Aureon would be pleased to host your office for that purpose at your earliest convenience.

It is in the context of existing demonstration capability that this LOI is submitted pursuant to two FOA categories:

- 1.1.1. Advanced Reactor Demonstrations (Demos).
- 1.1.2. Risk Reduction for Future Demonstrations (Risk Reduction)



### United States Owned Entities

For the purposes of this LOI, currently Aureon fulfils and agrees-to all requirements set forth under §910.124(d)(3). Aureon is currently completing all requirements to satisfy the 'United States owned entities' as specified under 2 CFR 910.124.

Aureon is pleased to announce that all documentation in these regards will be completed and submitted under the FOA deadline of 12 August 2020.

### Registration Process for Submitting Applications

Aureon is pleased to announce that all documentation in these regards will be completed and submitted under the FOA deadline of 12 August 2020.

Please do not hesitate to contact us at any time.

Respectfully yours,

A rectangular box containing a handwritten signature in black ink, which appears to be "Jonathan McMahon".

Jonathan McMahon  
CEO

A handwritten signature in black ink, which appears to be "Montgomery Childs".

Montgomery Childs  
Founder & President

Attachment

# THE SAFIRE PROJECT

AUREON ENERGY LTD.

Advanced Reactor Demonstration Program  
(ARDP)

FOA DE-FOA-0002271

AUREON  
ENERGY

Commercializing a clean Plasma Reactor

# EXECUTIVE SUMMARY

\$15 million dollars in cash and kind, and 7 years of empirical testing, have resulted in a unique patented stable spherical “SAFIRE” plasma reactor. AUREON ENERGY will commercialize the SAFIRE technology into four key markets:

- > clean energy production,
- > heating,
- > transmutation of elements (creating Rare Earth Elements),
- > remediation of nuclear waste.

Each market in itself represents a trillion dollar industry over the next ten years. All intellectual property and equipment created in the SAFIRE PROJECT has been assigned to Aureon Energy Ltd.

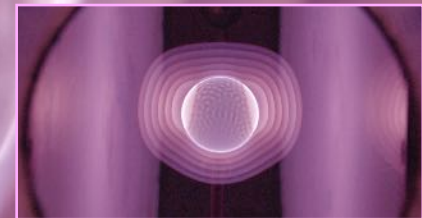


*The core in the SAFIRE Plasma Reactor*

# THE SAFIRE PROJECT~ ORIGINS

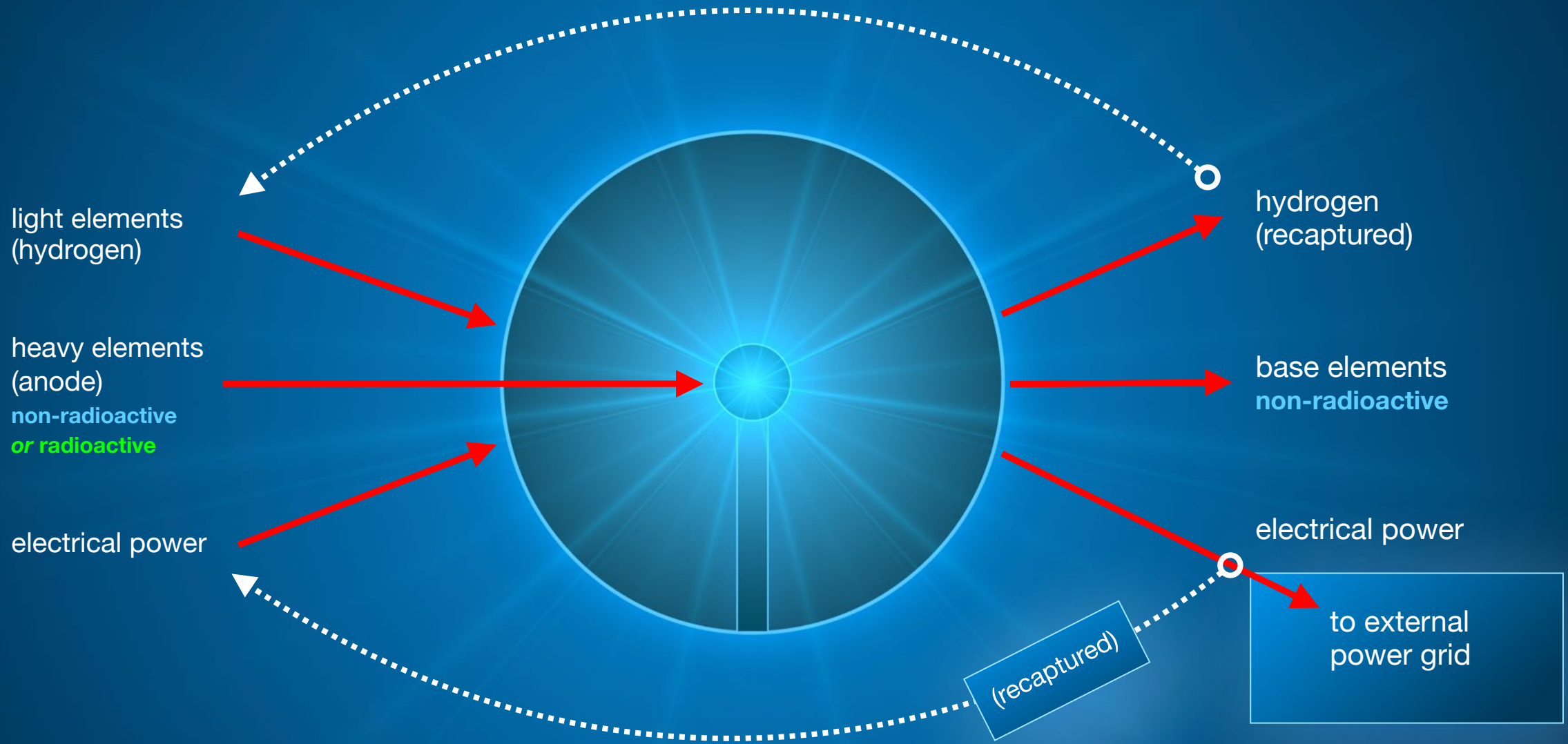
The SAFIRE team was able to create, control, contain, *sustain* and repeat-at-will numerous specific plasma regimes. A medium-energy stable plasma was discovered that can *transmute elements*, releasing unpredicted amounts of energy.

SAFIRE plasma regimes



# SAFIRE REACTOR

## CLEAN ENERGY



**boiling water > turbine > electric power**

# COMPANY TIMELINE

## 2011-2014

### PLANNING & PROOF OF CONCEPT

Team of engineers and physicists gather to design and build the first stable plasma reactor capable of safe nuclear transmutation.

International Science Foundation (ISF) Funding secured in 2013.

## 2015-2017

### DESIGN & TESTING OF NEW REACTOR

SAFIRE Reactor built and tested.

#### Results:

- > self-organizing electro-magnetic plasma
- > creating new elements in the chamber
- > excess energy

## 2018-2019

### REFINING PLASMA MODES & DEFINING PARAMETERS

Confirmed elemental transmutation - new elements created in the chamber.

Confirmed excess energy produced under certain conditions.

AUREON ENERGY is formed to exploit these discoveries.

## 2020-2025

### LAUNCH & COMMERCIALIZATION

Phase I

Phase II

Phase III

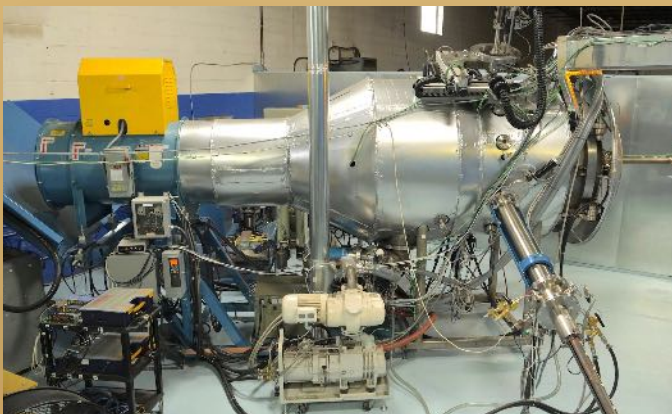
*(see below)*

# PHASED DEPLOYMENTS OVER 6 YEARS

## PHASE 01

### REFINING PROCESS AND DESIGNING NEW REACTOR

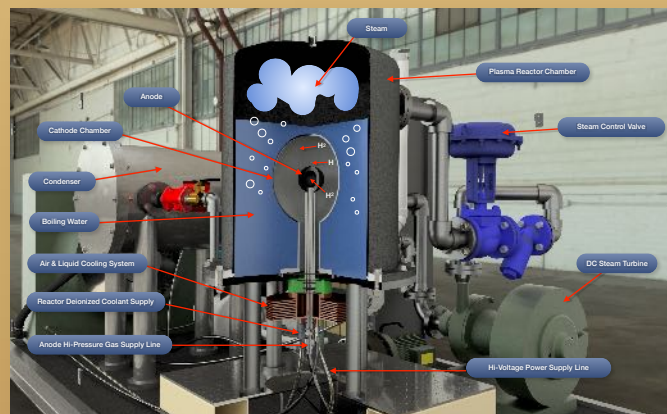
Aureon Energy will work with the existing SAFIRE reactor to characterize and maximize energy output, and document best methods for nuclear remediation. Aureon Energy will create commercial partnerships.



## PHASE 02

### BUILD NON-COMMERCIAL REACTOR PROTOTYPE

Aureon Energy will build a new reactor capable of handling the high-energy testing and technical refining required to produce a commercial prototype. Aureon will further expand and develop partnerships and licensees.



## PHASE 03

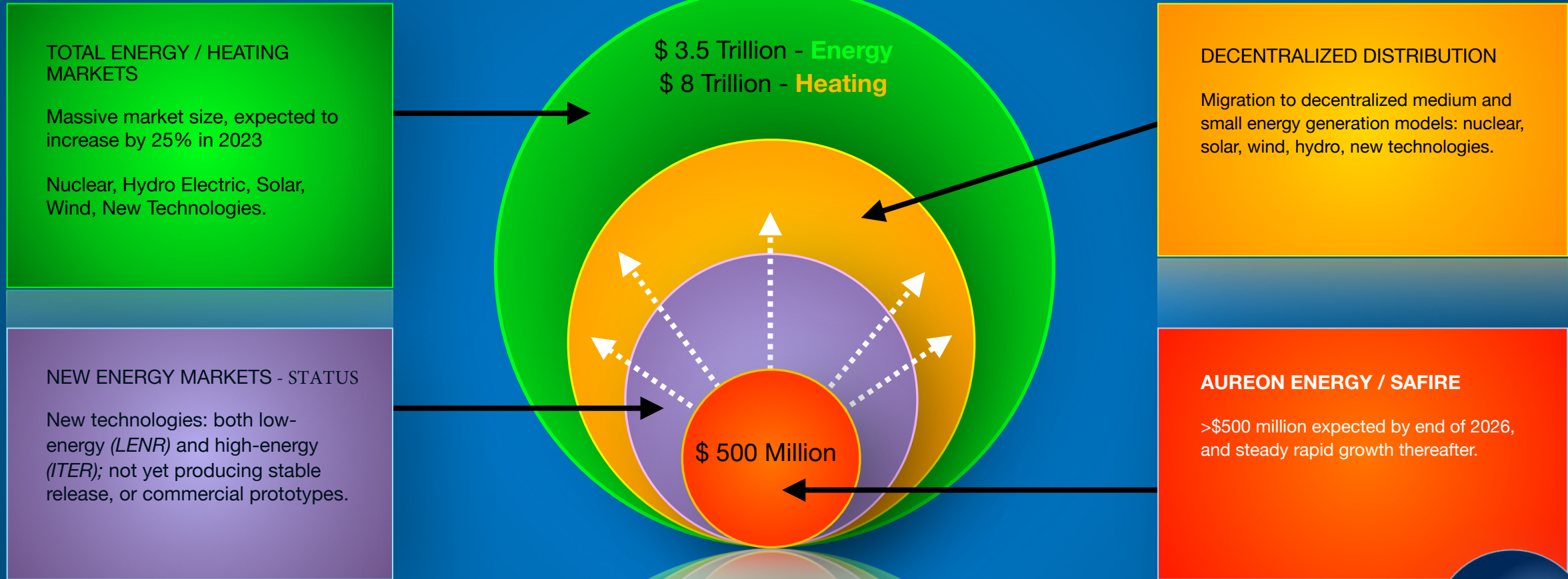
### MANUFACTURING OF FINAL COMMERCIAL PROTOTYPES

Aureon Energy will create the commercial Safire Reactor for energy production and remediation of larger volumes of nuclear industry byproducts, and build out the partnerships to include manufacturing and distribution





# ENERGY & HEATING MARKETS



2020 © AUREON ENERGY LTD.



Clean energy production is the fastest growing market on the planet. In 2017 \$200 Billion in the US and \$1.2 Trillion globally was invested in renewable energy projects worldwide. The amount of renewable energies produced and used each year is growing exponentially.

# NUCLEAR REMEDIATION MARKET ~ CURRENT

## NUCLEAR REMEDIATION

Currently all radioactive spent fuel is being stored at enormous expense in facilities or buried in the ground, constantly monitored and maintained.

The radiation half-life of nuclear waste can be measured in the thousands, even hundreds of thousands of years.

Radioactive spent fuel is what keeps the Nuclear Energy Industry from being the go-to technology for energy production.

\$ 300 Billion Annually

\$ 400 Million

A *transformational* technology, SAFIRE does not have to compete with existing businesses to be successful. In the instance of nuclear waste remediation the SAFIRE technology can be leased, sold to, or included in a partnership with current industry leaders in nuclear waste management.

### AUREON ENERGY / SAFIRE:

The commercial SAFIRE REACTOR will be designed to remediate (neutralize) radioactive nuclear waste while simultaneously generating energy.

Another key market for the SAFIRE REACTOR is the nuclear energy industry. The approximate worldwide cost to remediate and store nuclear waste is currently \$300 Billion annually.

AUREON  
ENERGY

# SAFIRE REACTOR & NUCLEAR ENERGY INDUSTRY SPECTRUM

## LOW ENERGY

LENR, Cold Fusion, and *all existing nuclear power plants* are **low** or **low-medium temperature** reactors. They require specially prepared solid fuels, which are expensive and often dangerously radioactive.

## MEDIUM ENERGY

SAFIRE is a stable **medium-temperature** plasma reactor currently producing a controllable plasma discharge, which can be generated at will, and run continuously over extended periods of time.

## HIGH ENERGY

ITER or Tokamak systems are **high-temperature** reactors. So far, they are inherently unstable and are not yet producing electricity.

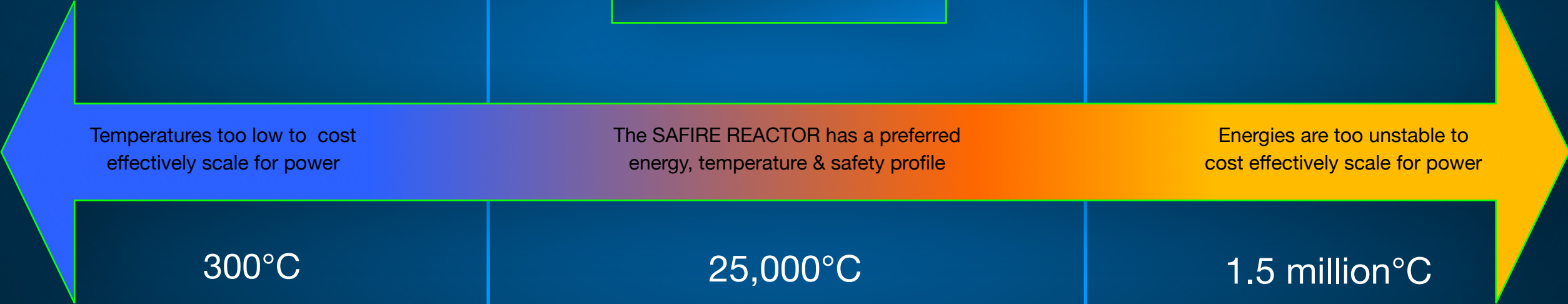
Electrode Reactions

Fission Reactor

**SAFIRE**

ARC Plasmas

ITER



# INTELLECTUAL PROPERTY STRATEGY

**PATENTS**

2 Patents Granted  
8 Pending  
2 Processing

INTELLECTUAL PROPERTY

Formula of Materials  
Process

TITLE	COUNTRY	SERIAL No.	FILING DATE	PATENT No.
ELECTRODE ASSEMBLY FOR PLASMA GENERATION	United States	62/547,432	08/18/2017	Pending
ION GENERATOR APPARATUS	United States.	62/547,455	08/18/2017	Pending
PLASMA HEATING APPARATUS, SYSTEM AND METHOD	United States	15/904,261	02/23/2018	Pending
ION GENERATOR APPARATUS	United States	16/105,365	08/20/2018	10,398,015
ION GENERATOR APPARATUS	Canada	3,014,940	08/20/2018	Pending
ELECTRODE ASSEMBLY FOR PLASMA GENERATION	United States.	16/105,190	08/20/2018	Pending
ELECTRODE ASSEMBLY FOR PLASMA GENERATION	Canada	3,014,970	08/20/2018	Pending
MANIPULATOR FOR MOVEMENT OF ARTICLES IN A CONTROLLED ENVIRONMENT CHAMBER	United States	62/181,006	06/17/2015	Pending
MANIPULATOR FOR MOVEMENT OF ARTICLES IN A CONTROLLED ENVIRONMENT CHAMBER	Canada	2,933,317	06/16/2016	Pending
MANIPULATOR FOR MOVEMENT OF ARTICLES IN A CONTROLLED ENVIRONMENT CHAMBER	United States	15/185,810	06/17/2016	10,040,190

2020 © AUREON ENERGY LTD.

# PHASE I

EXPECTED COMPLETION ~ MID 2021

\$100 MILLION PRE-MONEY VALUATION  
LOOKING FOR STRATEGIC INVESTORS  
MARKETING – FILMS, ARTICLES, WEBSITE

## MILESTONES TO ACHIEVE

- Energy Optimization - Thermodynamics
- Quantifying Energy Efficiency (COP)
- Quantifying Low Level Nuclear Remediation
- Identification of Industry Partners
- CNL, CERN, US DoE
- Application to Government Programs

# PHASE II

EXPECTED COMPLETION ~ MID 2023

FIRST OPTION TO PHASE 1 INVESTOR  
MANUFACTURING / DISTRIBUTION PARTNERS  
MARKETING – FILMS, ARTICLES, PAPERS

## MILESTONES TO ACHIEVE

- Build Development Test Reactor
- Move into a New Facility
- FINAL Thermal Efficiency Report

# PHASE III

EXPECTED COMPLETION ~ MID 2025

MANUFACTURING PARTNER CONTRACTS  
DISTRIBUTION PARTNER CONTRACTS  
MARKETING – FILMS, ARTICLES, PAPERS

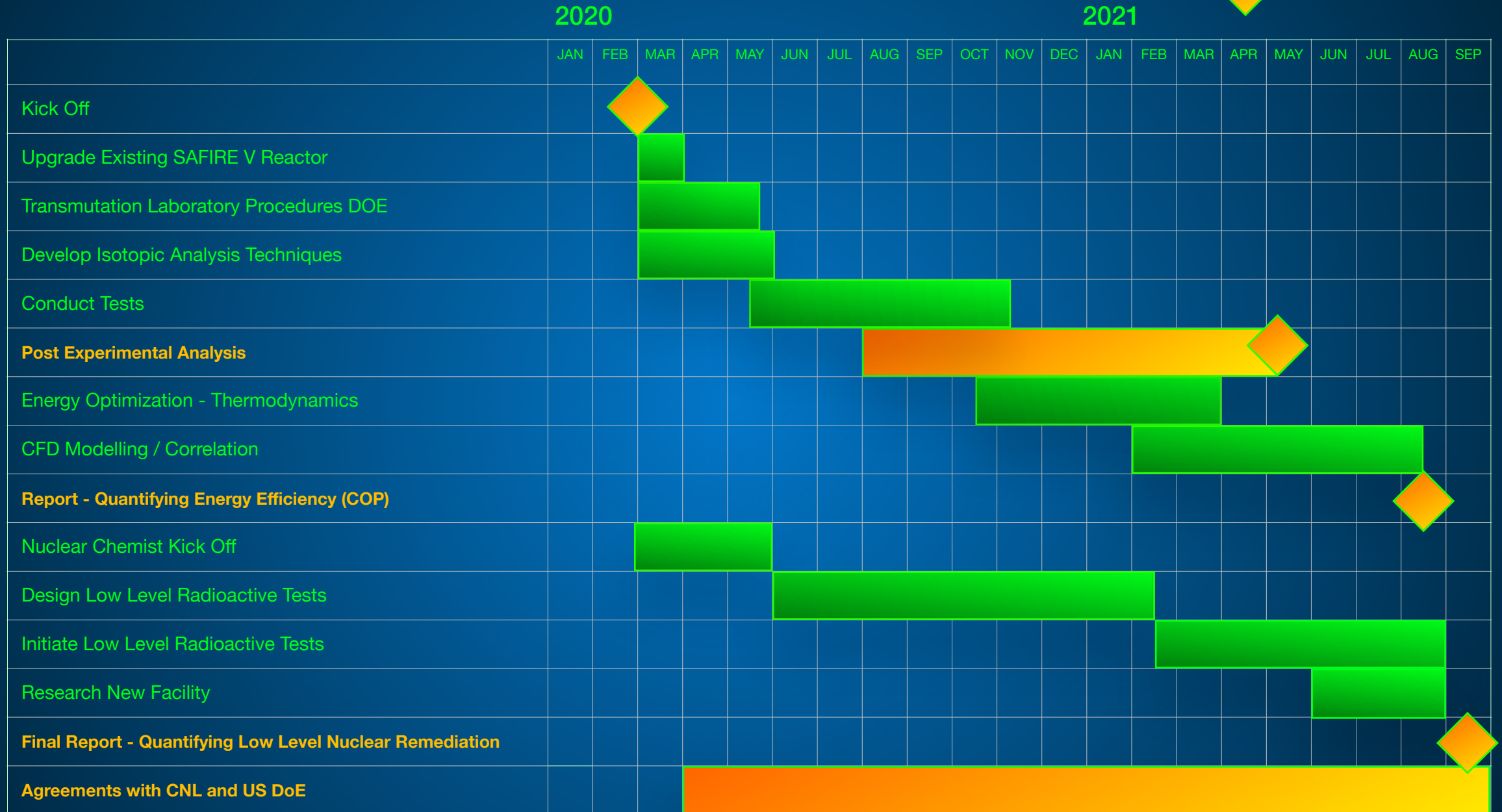
## MILESTONES TO ACHIEVE

- SAFIRE REACTOR Prototype Completed
- Low Level Remediation Testing Complete
- Partners - global commercial planning



# SCHEDULE FOR PHASE I

 = Key Milestones



2020 © AUREON ENERGY LTD.

# REVENUE / EXPENSES

Start-Up net revenue expected to convert to positive in approximately 2026

<b>\$ USD</b>	<b>PHASE 1 2020-2021</b>	<b>PHASE 2 2021-2023</b>	<b>PHASE 3 2023-2025</b>
<b>TOTAL REVENUE</b> (start with nuclear remediation clients)	\$0	\$1,500,000	\$3,000,000*
Human Resources (incl. Legal/Acc)	\$3,250,000	\$4,800,000	\$4,050,000
Reactor Expenses	\$505,000	\$2,244,000	\$1,628,000
Overhead	\$1,090,500	\$1,709,000	\$1,210,500
<b>TOTAL EXPENSES</b>	<b>\$4,845,500</b>	<b>\$10,253,000</b>	<b>\$6,888,500</b>

\*The expectation is that Aureon will generate hundreds of millions in revenue from licensing and sales of energy units towards the end of this decade.

# SAFIRE TEAM EXECUTIVES



**MONTGOMERY CHILDS**  
Founder & President



**JONATHAN MCMAHON**  
Chief Executive Officer



**DR. MICHAEL CLARAGE**  
Chief Science Officer



**DR. PAUL ANDERSON**  
Chief Technical Officer



**DENNIS REICH**  
Business Development



**TRACEY CHILDS**  
Financial & Legal



**BEN GED LOW**  
Film Production,  
Corporate Image



# SAFIRE TEAM & CONSULTING TEAM



BEN GED LOW

JASON  
LICKVER

JANO  
ANDERCO

SCOTT  
MAINWARING

GEORGE  
HATHAWAY

LEIGHTON  
MACMILLAN

HAL  
PUTOFF

MICHAEL  
CLARAGE

WAL  
THORNHILL

MONTGOMERY  
CHILDS

JAMES  
RYDER

PAUL  
ANDERSON

*not present*

JONATHAN MCMAHON

DR. DONALD SCOTT

ERIC DAVIS

WILLIAM GARDNER

# THE SAFIRE PROJECT

CONTACT:

JONATHAN MCMAHON / MONTGOMERY CHILDS

[jmcmahon@areon.ca](mailto:jmcmahon@areon.ca)

T: 502-264-1583

[mchilds@areon.ca](mailto:mchilds@areon.ca)

T: 705-717-9543

