upsen™

WORLDWIDE WIRELESS WARNING

-DISASTERS HAVE NO BORDERS-

A revenue-neutral program for providing 'Early Warning for All'
as a universal public service feature of mobile telecommunications...

UPSEN WORLDWIDE WIRELESS WARNING PROGRAM

-THE *'EARLY WARNING FOR ALL'* SOLUTION-

A Summary Presentation Presented by
the CIVIL EMERGENCY ALERT SERVICES ASSOCIATION
Of Critical Communications Working Groups

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D.D.WEISER, DIRECTOR

Global Mobile Emergency Notification: Challenges and Pathways

The Urgency of a Unified Warning Systems

The increasing frequency and scale of both natural and societal threats highlight the critical importance of the United Nations' 'Warning for All' initiative. As disasters ‘have no borders’, the need for emergency notifications that reach multinational audiences has become apparent. Currently, emergency alerts are managed at the national level, with no requirement for international harmonization. This gap underscores the necessity for a coordinated worldwide warning system.

Wireless Emergency Alerting: A Global Tool

With more than eight billion mobile users worldwide, wireless emergency alerting is becoming an essential component of disaster risk management. The responsibility for disseminating emergency alerts is no longer limited to governments; it now reflects the growing role of personal telecommunications in public safety

The Universal Public Service Emergency Notification (UPSEN) program offers a revenue-neutral solution that enables an alliance of satellite and cellular mobile telecommunication networks to deliver Wireless Emergency Alerting (WEA) services worldwide. The UPSEN Program and system supports the World Meteorological Organization's Global Multi-Hazard Alert System without requiring government intervention or financial investment.

Implementation and Direction

As there are no technical, financial, or political objections to the UPSEN Program and the need has been well established, the eventual availability of worldwide wireless warning is highly probable. Nonetheless, should the United Nations EW4A Panel be unable or unwilling to direct its establishment, responsibility for deployment will likely shift to multiple commercial and political organisations, which will substantially diminish the humanitarian benefit.

WORLDWIDE WIRELESS WARNING

"Today I announce the United Nations will spearhead new action to ensure every person on Earth is protected by early warning systems within five years."

UN Secretary-General António Guterres

LAUNCHED IN 2022 BY UNITED NATIONS SECRETARY-GENERAL, ANTÓNIO GUTERRES, 'EARLY WARNINGS FOR ALL', EW4A, IS A GROUNDBREAKING INITIATIVE TO ENSURE THAT EVERYONE ON EARTH IS PROTECTED FROM HAZARDOUS EVENTS THROUGH THE ESTABLISHMENT OF LIFE-SAVING EARLY WARNING SYSTEMS …

THE EMERGENCE OF SATELLITE MOBILE TELECOMMUNICATION HAVING GLOBAL COVERAGE, HAS MADE 'EARLY WARNING-FOR-ALL' ATTAINABLE.

WHILE WIRELESS WARNING SYSTEMS HAVE BEEN DEPLOYED IN FORTY NATIONS, OVER TWO-THIRDS OF THE WORLD IS UNABLE TO JUSTIFY THE EXPENSE CELLULAR EMERGENCY ALERTING.

HOWEVER, REGULATORY NATIONS CAN ATTAIN THE BENEFIT OF 'EARLY WARNING FOR ALL' WITH NO COST BY ALLOCATING THE MOBILE SPECTRUM NEEDED FOR SATELLITE TELECOMMUNICATION PROVIDERS TO ENABLE UNIVERSAL PUBLIC SERVICE EMERGENCY NOTIFICATION BROADCAST MESSAGING.

UPSEN
WORLDWIDE WIRELESS WARNING

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Sec I: *What are* THE CHALLENGES

IN 2002, THE PRESIDENT OF THE CELLULAR TELECOMMUNICATION INDUSTRY ASSOCIATION, (CTIA), TOM WHEELER, DEFINED THE CHALLENGES TO CELLULAR EMERGENCY ALERTING AS, " NOT TECHNICALLY IMPOSSIBLE, NOT ECONOMICALLY IMPOSSIBLE, BUT UNLESS REVENUE BASED, POLITICALLY IMPOSSIBLE!"…

- **TECHNICAL CHALLENGES:**

  Wireless broadcast messaging is highly effective for the distribution of time-sensitive emergency notifications, but cellular service covers less than a third of the Earth's landmass.. To achieve worldwide warning, a common platform capable of providing seamless cross-border dissemination of emergency information by terrestrial and satellite telecom messaging is required.

  - Integration of satellite and cellular geo-broadcast messaging protocols,
  - LEO satellite mobile telecom spectrum must be allocated
  - Most cellular handsets are not compatible with satellite technologies,
  - Engineering resources are limited,
  - CAP data must interface wireless broadcast technologies,
  - Messaging must be displayed on registered and non-registered devices,
  - The operating system must be secured,
  - Technologies and systems must comply with international standards and industry protocol,.

- **ECONOMIC CHALLENGES:**

  The cost of implementing broadcast messaging in cellular operator networks combined with investments for content platforms, and staff training, have prevented over 85% of nations from implementing wireless emergency alerting, resulting in many of the most vulnerable populations unprotected.

  - Must be revenue-sustained,
  - Negotiation processes ,
  - Non-tax-based funding,
  - Compensations for private asset usage,
  - Non-message-based funding,

- **POLITICAL CHALLENGES:**

  UPSEN must address national sovereignty and policy considerations:

  - Maintain jurisdictional oversight,
  - Providing political incentives,
  - Supporting government objectives,
  - Preservation of national sovereignty,
  - Political and legislative procedures,

- Use of general taxes for the benefit the mobile user segment,

SEC II: *What is* WIRELESS EMERGENCY ALERTING (WEA)

THE GRID OF WIRELESS TELECOM TRANSMITTERS THAT ALLOWS EMERGENCY AUTHORITIES TO SELECTIVELY CONNECT WITH 'AT-RISK' POPULATION GROUPS THROUGH WIRELESS DEVICES ROUTINELY OWNED AND CARRIED BY OVER EIGHT BILLION PEOPLE, DEFINES WIRELESS EMERGENCY ALERTING...

WEA IS NOW UNIVERSALLY ACCEPTED AS THE MOST EFFECTIVE MEDIA FOR THE TIMELY DISSEMINATION OF EMERGENCY ALERTS AND WARNINGS.

➢ **WEA MESSAGING TECHNOLOGIES**:

- CELLULAR
  a) Short Messaging Service (SMS):
  SMS Is a 'One-to-One' connectivity managed by an SMS Gateway. Each alert is sent individually, which allows tracking of the received messages which permits responders to know user locations and identities. However, SMS requires the maintenance of a user database and messaging can be delayed due to network load.
  b) Cell Broadcast (CB):
  CB Is 'One-to-Many' mass-messaging system was developed by the industry to transmit real-time emergency alerts to unlimited recipients in a selected geographic area. CB messaging has the benefit of not affecting or being allected by, network traffic loads and can only be sent by the wireless operators assuring their authenticity,
- Direct-to-Device (D2D)
  a) LEO Satellites:
  Provides broadcast messaging to regions where cellular infrastructure is not deployed,
  b) Aerial Messaging Platforms:
  AMPs are used for radio dispatch, and cellular messaging when mobile telecom infrastructure is not available,

SEC III: *What is* CEASA

FORMED IN 1988, THE CIVIL EMERGENCY ALERT SERVICES ASSOCIATION (CEASA) IS AN INFORMAL ASSOCIATION OF CONTRIBUTING ENGINEERS, ACADEMICS, AND EMERGENCY MANAGEMENT AUTHORITIES…

THE ASSOCIATION IS DEDICATED TO THE INDEPENDENT RESEARCH AND DEPLOYMENT OF CRITICAL WIRELESS TELECOMMUNICATION TECHNOLOGIES THAT HAVE POTENTIAL HUMANITARIAN BENEFIT BUT ARE LACKING SUFFICIENT PROFIT POTENTIAL TO SUPPORT COMMERCIAL DEVELOPMENT

- **CEASA BACKGROUND:**
  - **History:**

    During a visit to tsunami-stricken Sri Lanka in 2005, the association's Honorary Secretary General, Mark Wood, listened to residents of the fishing village Ahungelle share their fear of the unannounced terror from the sea, which had made them afraid to sleep at night.
  - **Initiative:**

    The CEASA goal is to provide all peoples better access to critical information regarding unseen threats, assuring peace of mind "So we can all sleep at night",
  - **MISSION:**

    The Civil Emergency Alert Services Association mission is to establish the need, availability, and commercial viability of existing and emerging wireless technologies for mitigating disaster risk and reducing public vulnerability.
  - **OBJECTIVE:**

    To develop trust protocols that define how private assets can be used to provide public benefit through globally harmonized and financially sustainable initiatives.
  - **PLEDGE:**

    CEASA is, and shall remain, an independent resource,
  - **VISION**

    It is the vision of CEASA to save lives, relieve suffering, and restore order, through effective dissemination of critical information,

- **INTELLECTUAL PROPERTIES:**

  CEASA is the recognized originator of the Wireless Emergency Alerting concept, I.e. CellAlert® Service
  - CEASA authored Wireless Emergency Alert Patents;

i.	US 10917760	Point-to-multipoint message processing system and method
ii.	US 10674322	Point-to-multipoint message processing system and method
iii.	US 20180213368	POINT-TO-MULTIPOINT MESSAGE PROCESSING SYSTEM AND METHOD
iv.	US 9924328	Geotargeted broadcast message aggregator/gateway system and method
v.	US 20170243251	Systems and Methods For Distributing Promotions Over Message Broadcasting And Local Wireless Systems
vi.	US 20150382158	GEOTARGETED BROADCAST MESSAGE AGGREGATOR/GATEWAY SYSTEM AND METHOD
vii.	US 9224160	System and method for message receipt verification in a wireless mobile message broadcasting system
viii.	US 9224161	System and method for verifying message delivery integrity in a wireless mobile message broadcasting system
ix.	US 9136954	Broadcast alerting message aggregator/gateway system and method

x.	US 8583519	Message broadcasting network usage billing system and method
xi.	US 20130244565	BROADCAST ALERTING MESSAGE AGGREGATOR/GATEWAY SYSTEM AND METHOD
xii.	US 8438212	Message broadcasting control system and method
xiii.	US 8438221	Broadcast alerting message aggregator/gateway system and method
xiv.	US 20120214521	SYSTEM AND METHOD FOR VERIFYING MESSAGE DELIVERY INTEGRITY IN A WIRELESS MOBILE MESSAGE BROADCASTING SYSTEM
xv.	US 20120214405	SYSTEM AND METHOD FOR MESSAGE RECEIPT VERIFICATION IN A WIRELESS MOBILE MESSAGE BROADCASTING SYSTEM
xvi.	US 20120191771	MESSAGE BROADCASTING CONTROL SYSTEM AND METHOD
xvii.	US 20120142307	BROADCAST ALERTING MESSAGE AGGREGATOR/GATEWAY SYSTEM AND METHOD
xviii.	US 8155671	Commercial mobile alerting system and method for broadcasting messages to geo-fenced target areas
xix.	US 8103719	Message broadcasting control system and method
xx.	US 8073903	Message alert broadcast broker system and method
xxi.	US 20110230202	COMMERCIAL MOBILE ALERTING SYSTEM AND METHOD FOR BROADCASTING MESSAGES TO GEO-FENCED TARGET AREAS
xxii.	US 20110191224	MESSAGE BROADCASTING NETWORK USAGE BILLING SYSTEM AND METHOD
xxiii.	US 7917413	Message broadcasting billing system and method
xxiv.	US 7801538	Message broadcasting geo-fencing system and method
xxv.	US 20100174779	MESSAGE BROADCASTING CONTROL SYSTEM AND METHOD
xxvi.	US 7693938	Message broadcasting admission control system and method
xxvii.	US 20100029245	MESSAGE ALERT BROADCAST BROKER SYSTEM AND METHOD
xxviii.	US 20070136132	Systems and methods for distributing promotions over message broadcasting and local wireless systems
xxix.	US 20070124368	Systems and methods for distributing promotions over message broadcasting and local wireless systems
xxx.	US 20070123220	Message broadcasting geo-fencing system and method
xxxi.	US 20070117538	Message broadcasting billing system and method
xxxii.	US 20050261012	Public service message broadcasting system and method

SEC IV: *What is* UPSEN

UNIVERSAL PUBLIC SERVICE EMERGENCY NOTIFICATION (UPSEN) IS A GLOBAL EMERGENCY DATA DISSEMINATING SERVICE…
UPSEN EQUIPS WIRELESS TELECOMMUNICATION NETWORKS TO PASSIVELY COLLECT AND DISTRIBUTE CRITICAL EVENT INFORMATION FROM UN-REGISTERED ALERT AUTHORITY DATA HUBS THROUGH BROADCAST MESSAGING. THE SERVICE IS REVENUE SUSTAINED BY SURCHARGE FEES COLLECTED FROM MOBILE USERS WHO BENEFIT FROM THE ENHANCED SECURITY, NOT GOVERNMENTS.

- **DEPLOYMENT:**
  UPSEN Personal Alert Messaging (PAM) is provided by the licensed personal telecom operators in regulatory nations seeking a cost-free public warning capability,

- **MESSAGING PRACTICES:**
  UPSEN MESSAGING IS HELD TO THREE RECOGNIZED PRINCIPALS…
  1. CAP compliance,
     Authenticates the non-repudiation of alert originators and verifies alerting actions comply with territorial authorization,
  2. Mandate compliance,
     Required action directives are the exclusive right of governments and cannot be superseded by 'outside' organizations,
  3. National Regulatory Framework,
     All nation states must have regulatory bodies responsible for the orderly administration and licensed use of radio spectrum according to international agreements.

- **FEASIBILITY:**
  BECAUSE THERE ARE NO TECHNICAL, ECONOMIC, OR POLITICAL BARRIERS TO UNIVERSAL PUBLIC SERVICE EMERGENCY NOTIFICATION IS INEVITABLE…
  - THE UN HAS ESTABLISHED THE NEED
  - ALL MESSAGING IS SECURED BY COMMON ALERTING PROTOCOLS
  - NOTHING IS BOUGHT
  - NOTHING IS SOLD
  - REVENUE SUSTAINED
  - ALL ACTORS GAIN
  - ALL HUMANITY BENEFITS

SEC V: *WHAT IS* THE ROLE OF PERSONAL TELECOMMUNICATIONS

OVER EIGHT BILLION PEOPLE NOW OWN AND ROUTINELY CARRYING WIRELESS TELECOMMUNICATIONS DEVICES…

EMERGENCY MESSAGING HAS BECOME SYNONYMOUS WITH DISASTER RISK MANAGEMENT, AND THE LOGICAL ROLL OF PERSONAL TELECOMMUNICATIONS. WITH THE NEED, FEASIBILITY, AND FUNCTIONAL BENEFITS OF WIRELESS EMERGENCY ALERTING THOROUGHLY ESTABLISHED, PROVIDING EMERGENCY WARNING CAN NO LONGER BE CONSIDERED THE SOLE RESPONSIBILITY OF GOVERNMENTS,

- **FUNCTIONAL ASSETS:**
  The integrated broadcast coverage of cellular and satellite personal telecommunication will provide 'gap-free' 'Early Warning for All' nations,

- **SPECTRUM OBLIGATION:**
  THE LICENSED USE OF PUBLIC RADIO SPECTRUM FOR WIRELESS TELECOMMUNICATIONS IMPLIES AN OBLIGATION OF PUBLIC BENEFIT,

- **BACKGROUND:**
  PERSONAL TELECOMMUNICATIONS MARKETS THE ENHANCEMENT OF PUBLIC SAFETY.
  - In 1993, the GSM, (Global Mobile Service), committees formulated industry standards for 'Point-to-Multipoint', (i.e. Cell Broadcast CB) messaging, for the mass distribution of some classes of information such as time-sensitive emergency warnings,
  - In a letter to FCC chairman Reed Hunt in 1995, CEASA, informed the commissioner that the emerging grid of low-range G2 cellular transceivers could be adapted to deliver location-specific emergency alerts as called for by FCC rulemaking, with the stated purpose of reforming the Emergency Broadcast System into an Emergency Alert Service,.
  - 1997, CEASA was invited to participate in the White House Office of Science and Technical Policy's (OSTP) National Disaster Information Systems, NDIS committee for Effective Disaster Warning, concluded that the association's position that cellular broadcast messaging was the best media available for providing emergency notifications was valid,
  - CEASA introduced the concept of using cellular broadcast messaging for geo-specific notification of imminent threats to public safety to the UN ITU in 1998.
  - In 1998 the first patent protection for a Cellular Activated Emergency Notification, (CAENS), system was granted to the CEASA director, D. D. Weiser,
  - The 'Fifteen Points of Effective Emergency Alerting' Certification for use of the CEASA CellAlert registered trademark, was introduced in 2000.
  - In 2004, the association conducted the first Mobile Operator Network demonstration of Cellular Emergency Alert Service, establishing that the cell broadcast messaging functionality was, contrary to the US industry position, operational in all GSM standard handsets.
  - In 2010, Florida State conduced a 'Proof-of-Concept' trial of Cellular Emergency Alert Service, in a partnership with MetroPCS, Syniverse, and Alcatel Lucent/Nokia. using the cell broadcast gateway operating system developed by CEASA Working Group contributors.
  - 2012 saw the deployment of Wireless Emergency Alert, WEA, service in the US using the Aggregator Gateway system developed by CEASA Group members and patented by CellCast Technologies LLC,

SEC VI: *What is* THE UPSEN PROGRAM

WHILE THERE HAVE BEEN MAJOR ADVANCEMENTS IN IDENTIFYING IMMINENT DISASTER THREATS, THE HUMANITARIAN BENEFIT RELIES ON THE EFFECTIVENESS BY WHICH 'CITIZENS-AT-RISK' ARE INFORMED…

THE UPSEN PROGRAM RECOGNIZES 'EARLY WARNING FOR ALL' REQUIRES A GLOBAL SOLUTION,

- **ASPECTS:**
  - **TECHNICAL**
    The UPSEN Plan has two enabling process components,
    1) The Data-Side components replace national 'push-data' aggregator gateways with a single 'pull-data' Syndication Utility that collects and processes emergency data posted by alert authority Information Hubs for distribution by wireless technologies,
    2) The Radio-Side Components define the broadcast geocoordinates, formats Common Alerting Protocol (CAP) data to interface with terrestrial and extraterrestrial wireless technologies, and if required, can passively enable cellular networks to broadcast emergency messaging,
  - **FINANCIAL**
    UPSEN operating revenue is generated by ongoing monthly surcharges on mobile users, not onetime investments by nations. The acquisition of an UPSEN enabling subscription positions mobile operators to offer regulatory nations no-cost Wireless Warning in quid pro quo for spectrum considerations, while facilitating commercial broadcast/multicast traffic,
  - **ADMINISTRATIVE**
    THE UPSEN PROGRAM requires wireless emergency alert messaging to be globally administered by a nonprofit alliance of wireless operators in association with regulatory nations and the CEASA advisory board,

- **PROGRAM INITIATIVES:**
  UPSEN aims to achieve these commitments;;
  1. Jointly deploy Universal Public Service Emergency Notifications as a standard public safety feature,
  2. Provide for a standardized international warning protocol,
  3. Arrange for the underwriting of setup costs,
  4. Institution of a self-sustained funding plan,
  5. Establishment of agreed terms for accessing required network operations data,
  6. Support the allocation/reallocation of mobile spectrum for non-terrestrial and direct-to-device emergency messaging,
  7. The exemption of technology licensing for public safety use,
  8. Position UPSEN to complement national warning systems,

- **PROGRAM BENEFITS:**
  - Public Benefits

    UPSEN integrates satellite and cellular technologies and mobile penetrations to enable 'Warnings for All'.
    I. Cellular networks provide precise geotargeted alerting in densely populated regions,
    II. Low Earth Orbit Satalites provide wide area alerting in low population regions,
    III. Low Earth Orbit Satellites and Aerial Messaging Platforms (AMPs) provide alerting when terrestrial systems are not operating,
    IV. Whereas broadcast messaging can only be initiated by a wireless provider, the validity of UPSEN Personal Alerts are assured.
    V. UPSEN remains operational when voice and text messaging services are compromised.
    VI. Recipient identities remain unknown.
  - National Benefits

    Regulatory nations need only to 'encourage' their licensed wireless providers to include the Personal Emergency Alert messaging feature in their jurisdiction,
  - Risk Management Benefits
    i. The UPSEN program reduces disaster costs by providing a timely resource and recovery information media.
    ii. UPSEN includes the use of unmanned Aerial Messaging Platforms (AMPs) to maintain continued access to authoritative instruction when mobile networks are disabled,.
    iii. UPSEN delivers cross-border emergency notifications in under-developed regions to counter human and child trafficking,
    iv. UPSEN lowers disaster-related costs by supplying affected populations with timely resource and recovery information.
  - First Responder benefits

    UPSEN can provide messaging backup to command-and-control radio dispatch,
  - Information Society benefits

    Alert authorities gain a real-time data syndicating media to expand public access to geo-specific event information,
  - Wireless Telecom Provider benefits
    i. The ability to provide users emergency warning without a legislative mandate.
    ii. Receive fair compensation for the use of private infrastructure and spectrum assets for a non-revenue public benefit,
    iii. Pro-bono establishment of 'EW4A' will assist in LEO satellite spectrum allocation and facilitate integration with terrestrial networks,
    iv. The UPSEN global mobile broadcast capacity will create a commercial data dissemination network that utilises less than one percent of the spectrum required by conventional non-broadcast data networks.
    v. Facilitate the development of commercial broadcast traffic markets,
  - Industry Benefits

    Wireless communications and emergency management vendor markets will have a five hundred percent expansion of their markets,

SEC VII: *What is* THE UPSEN PERSONAL ALERT FEATURE

PERSONAL ALERT™ IS A WORLDWIDE WIRELESS EMERGENCY MESSAGING SERVICE AVAILABLE TO ALL NATIONS IN SUPPORT OF THE UN SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION…

- **CURRENTLY:**
  WIRELESS EMERGENCY ALERT SYSTEMS ARE ADMINISTERED BY INDIVIDUAL NATIONS…
  I. There is a recognized need for cross-border dissemination of critical event information.
  II. Effective disaster risk management requires a widely accepted method for authority-to-citizen data dissemination./6
  III. Most emergency notifications are structured to address hydro-meteorological threats.
  IV. Most emergency alert systems do not provide for post-event international relief agency advisories,
  V. Child and human trafficking event management lacks a cross-border notification capability needed to encourage international incident reporting.
  VI. Non-broadcast based messaging services, such as SMS texting and social media posts, are increasingly being exploited by malicious actors.

- **HANDSET PERFORMANCE:**
  ALL HANDSET FUNCTIONALITY IS DETERMINED BY THE MOBILE TERMINAL PROVIDERS IN COMPLIANCE WITH 3GPP STANDARDS…
  - UPSEN Personal Alerts are default displayed in English, and the user-selected language.
  - The broadcast messaging feature may be 'hidden' in some G-2 and G-3 terminals,
  - Not all mobile handsets are compatible with satellite messaging,
  - Connectivity to an UPSEN enabled network can be shown in the handset notification bar,

- **MESSAGE CONTENT:**
  UPSEN DOES NOT RECEIVE OR ORIGINATE EMERGENCY CONTENT…
  - ALL ALERT AND ADVISORY INFORMATION IS COLLECTED FROM DESIGNATED ALERT AUTHORITY DATA HUBS.
  - UPSEN MESSAGING CAN ONLY INFORM, IT CANNOT INSTRUCT, UNLESS AUTHORIZED BY A JURISDICTION'S LEGAL AUTHORITY

- **UPSEN NOTIFICATION LEVELS:**
  UPSEN HAS FOUR LEVELS OF ALERT MESSAGING IN COMPLIANCE WITH THE INTERNATIONAL STANDARD 3GPP 023.041…
  - LEVEL ONE: ALERT, REQUIRES IMMEDIATE ACTION TO BE TAKEN AND IS IDENTIFIED BY AN INTRUSIVE ALERT TONE THAT FOLLOWS THE ATIS 700036 LOGIC. LEVEL ONE ALERTS REQUIRE GOVERNMENT AUTHORIZATION AND CANNOT BE DESELECTED,
  - LEVEL TWO: WARNING, RESERVED FOR IDENTIFYING POTENTIAL RISKS TO PUBLIC SAFETY, INCLUDING CHILD TRAFFICKING EVENTS. CURRENTLY, THERE IS NO STANDARD FOR PERMITTING A LEVEL TWO ALERT TONE AND WILL BE INDICATED BY A NOTIFICATION TONE. LEVEL TWO ALERTS CAN BE DESELECTED,
  - LEVEL THREE: ADVISORY, PROVIDES FOR THE DISSEMINATION OF POST-EVENT RECOVERY INFORMATION ANNOUNCED BY THE STANDARD NOTIFICATION DISPLAY AND RECEIPT TONE. LEVEL THREE ADVISORY CAN BE DISABLED,
  - LEVEL FOUR: CLOSED USER GROUP RESERVED FOR BACKUP COMMUNICATIONS, AND SYSTEMS TESTING. THIS NOTIFICATION LEVEL IS AN OPT IN APPLICATION AND CANNOT BE RECEIVED BY THE GENERAL POPULATION. LEVEL FOUR MAY ALSO BE USED TO DRIVE APP-BASED AND M2M APPLICATIONS,

SEC VIII: *What is* UPSEN ENABLING

UPSEN is activated in wireless telecommunications networks via an opt-in interface to the UPSEN Enabling Platform, which employs passive data syndication for the centralised collection, processing, and wireless distribution of personal alert messaging…

- **ENABLING PLATFORM:**
  The UPSEN Enabling Platform (UEP) employs an automated Pull-Data Syndication Utility to retrieve and format global emergency event notifications published in UN-registered alert authority data hubs for distribution via wireless broadcast and multicast technologies.

- **GLOBAL COVERAGE:**
  UPSEN seamlessly integrates terrestrial cellular and LEO satellite telecommunication services to ensure comprehensive, uninterrupted Worldwide Wireless Warning, (WWW),

- **DATA SIDE COMPONENTS**

1) **AUTHORIZED ALERT AUTHORITY DATA HUBS**
   Originates and publishes CAP compliant emergency-event notifications,
2) **CENTRAL ENABLING UNIT (CEU)**

SPECIFICATIONS:

- Drives an unlimited scale of Regional Enabling Units,
- Services up to 25 spectrum markets.
- Poles an unlimited number of alert hub URLs.
- Services an unlimited scale of wireless devices,

DATA PORTAL:

(a) PULL-DATA MONITOR
Scan monitors registered Alert Authority URLs for intelligence postings,
AI evaluation of related intelligence sources,
Collects data from the URLs included in the UPSEN Registry,

(b) Database Registry
Compilation of authorized alert authority data hubs,

(c) Data Filter
Rejects non-Common Alerting Protocol (CAP) compliant data,,

(d) Records Generation
Generates system activity log,
Acknowledges content retrieval,
Records the message type and content source,
Produces the UPSEN Personal Alert Messaging Proposal,

DATA PROCESSING:

(e) CONTENT AGENT
Screens data for UPSEN specific content,

Establishes UPSEN messaging geo polygon dissemination coordinates,

(f) Translator Tool

Translates messaging content into the UN languages,

(g) Data Management

Assigns the data distribution protocol,
Interfaces with wireless technologies,
Converts CAP messaging coordinates to wireless distribution system polygons,

(h) Data Handler

Determines what wireless MON and satellite broadcast providers are indicated,
Collects MON Cell Plan data,
Generates Direct-to-Device receptor cells,
Establishes message timing,
Compiles distribution records,
Allows for SMS text messaging of activations,

➢ Radio Side Components

3) Regional Enabling Unit (REU)

Specifications:

- Supports up to 5 million connected users (max),
- Interface with a 2,000 Cellular Base Stations,
- Services 2,000 Direct-to-Device Geo-Transmission Cells,
- Services 10 Spectrum Markets (max),

Systems Interface:

(I) Data Addressing

Compiles Device-Based Geo-Fencing (DBGF) geo polygon coordinates,
Converts CAP polygon coordinates to broadcast technology distribution coordinates,

(j) Data Router

Directs text messaging data to geo-determined wireless distribution systems,

(k) Wireless Handler

Provides engineered interface with D2D and cellular broadcast protocols,

(l) Shared Broadcast Centre

Activates wireless point-to-multipoint messaging in nonbrocast activated cellular networks

4) Wireless Broadcast Technologiy Systems

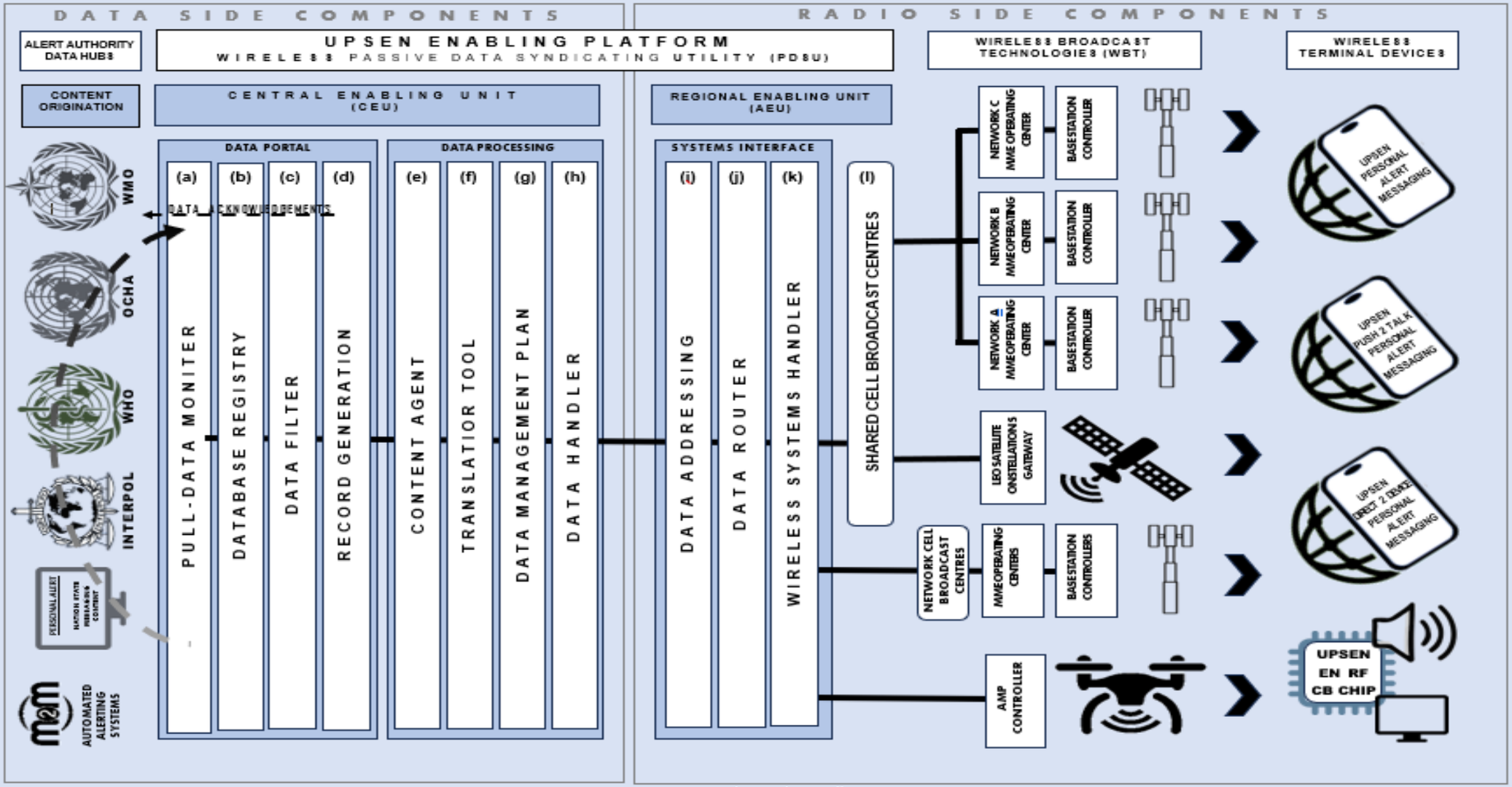
- Broadcast enabled cellular Networks,
- Non-broadcast enabled cellular networks,
- LEO Satallite telecommunications systems,
- Direct 2 Device aerial messaging platfotms, (AMPs),

5) Data Terminals

- Mobile Telecom Handsets,
- LEO Satellite Receivers,

UPSEN
WORLDWIDE WIRELESS WARNING

UNIVERSAL PUBLIC SERVICE EMERGENCY NOTIFICATION ENABLING PROCESS



SEC IX: *The* UPSEN ADMINISTRATION

THE UPSEN PROGRAM IS ADMINISTERED BY A NONPROFIT NGO ALLIANCE OF PERSONAL TELECOMMUNICATION PROVIDERS IN ASSOCIATION WITH REGULATORY NATIONS, UNDER THE DIRECTION OF THE CEASA CRITICAL COMMUNICATIONS WORKING GROUPS…

THE "UPSEN MOBILE ALLIANCE" IS TO INCLUDE ADVISORY MEMBERS REPRESENTING; UN AGENCIES, INDUSTRY STANDARDS BODIES, AND TECHNOLOGY VENDORS,

- **ADMINISTRATIVE CAVEAT:**
  ESTABLISHMENT OF THE UPSEN ADMINISTRATIVE MOBILE ALLIANCE WILL REQUIRE FINANCIAL SPONSORSHIP TOTALING ONE MILLION CHF (1.25M USD)

- **THE MISSION:**
  THE MISSION OF THE UPSEN ALLIANCE IS TO ESTABLISH A CORPORATE AND LEGAL FRAMEWORK FOR ADMINISTERING UPSEN PERSONAL ALERT MESSAGING AS A STANDARD SPECTRUM OBLIGATION OF WIRELESS TELECOMMUNICATION LICENSING, IN ACCORDANCE WITH THE ALLIANCE'S BYLAWS.

- **MANAGEMENT;**
  THE ALLIANCE SHALL BE FORMED BY INTERIM MANAGEMENT APPOINTED THROUGH THE CELLULAR EMERGENCY ALERT SERVICES ASSOCIATION WITH THE AIM OF;
  1) SECURING FINANCIAL UNDERWRITING AS DETERMINED BY THE UPSEN PROGRAM REVENUE STATEMENT,
  2) ESTABLISHING AN INTERIM EXECUTIVE BOARD COMPRISED OF; AN ACTING EXECUTIVE DIRECTOR APPOINTED BY THE CEASA BOARD, A NONPROFIT ASSOCIATION CONSULTANT, WITH REPRESENTATIVES FROM; LAND MOBILE OPERATOR NETWORKS, THE SATELLITE TELECOM PROVIDERS, AND THE UN EARLY WARNING FOR ALL INITIATIVE ADVISORY PANEL,

- **INITIATIVE:**
  THE ADOPTION OF RELIABLE, TRANSPARENT, LEGAL, AND NON-DISCRIMINATORY POLICIES AND REGULATORY MEASURES TO OPTIMIZE THE BENEFITS OF THE UPSEN WORLDWIDE WARNING PROGRAM.

- **MEMBERSHIP:**
  ALLIANCE MEMBERSHIPS WILL BE OPEN TO;
  1) THE UPSEN PARTNERED WIRELESS SERVICE PROVIDERS,
  2) EW4A FORUM MEMBERS
  3) REGULATORY STATES,
  4) ALLIANCE SPONSORS,
  5) UN REGISTERED ALERT AUTHORITIES
  6) NON-VOTING ASSOCIATE MEMBERS,

SEC X: *What Are* THE COSTS

UPSEN ENABLING INVESTMENT COST RANGE:		PER 5M UTILITY $7.250M-$4.543M US	PER USER $1.450-$0.909 US/USER	MONTHLY PSO USER FEE $0.121-$0.076 US/MO
• **CENTRAL ENABLING UNIT (CEU)**		**$2.700M-$1.750M US**	**$0.540-$0.350 US/USER**	**$0.045-$0.030 US/MO**
1) Setup Programming Costs:	**$2.200M-$1.500M US**			
Pull Data Portal Platform:	$0.450M-$0.325M US			
(a) Content Selector Programming	0.300M-0.250M (Budgeted)			
(b) Database Registry Programming	0.050M-0.025M (Budgeted)			
(c) Data Filter Programming	0.050M-0.025M (Budgeted)			
(d) Records Generation Programming	0.050M-0.025M (Budgeted)			
Data Processing Platform:	$1.250-$0.925M US			
(e) Content Agent Programming	0.200M-0.150M (Budgeted			
(f) Messaging Translation Tool	0.050M-0.050M (Budgeted)			
(g) Data Management Programming	0.750M-0.550M (Budgeted)			
(h) Data Handler Programming	0.250M-0.175M (Budgeted)			
2) Deployment Engineering:	**$0.500M-$0.250M US**			
3) Systems Engineering:	**$0.500M-$0.250M US**			
• **PER 5M REGIONAL ENABLING UNIT (AEU)**		**$2.450M-0.925M US**	**$0.490-$0.185 US/USER**	**$0.041-$0.015 US/MO**
1) Setup Programming Costs:	**$0.400M-0.325M US**			
Data Interface Platform	**$0.400M-$0.325M US**			
(i) Dissemination Program	0.250M-0.250M (Budgeted)			
(j) Data Router Program	0.125M-0.050M (Budgeted)			
(k) Wireless Systems Handler Program	0.025M-0.025M (Budgeted)			
2) Technology Investment	**$0.750M-$0.350M US**			
(l) Shared CBC (3G 4G/5G Compatible)	0.750M-0.350M (Budgeted)			
3) Engineering Cost:	**$1,250M-$0.250M US**			
CB Interface Engineering	0.750M-0.000M (Budgeted)			
Satellite Technology Interface	0.500M-0.250M (Budgeted)			
• **FINANCING (Year-One @ 26 APR)**		**$1.868M-1.181M US**	**$0.374-$0.020 US/USER**	**$0.031-$0.002 US/MO**

- **NON-INTEREST-BEARING OBLIGATIONS:** **$0.946M US**

		PER 5M UTILITY	PER USER	MONTHLY PSO USER FEE
UPSEN ENABLING UTILITY PER ANNUM COST RANGE:		**$7.832M-6.191M US**	**$1.566M-$1.239M US**	**$0.130-$0.104 US/MO**
• **CENTRAL ENABLING UNIT (CEU) OPERATIONS**		**$5.516M-4.533M US**	**$1.103-$0.907 US/USER**	**$0.092-$0.076 US?MO**
1) Annual Technology Cost:	**- 0 -**			
2) Annual Engineering Costs:	**$0.500M-$0.250M US**			
System Maintenance	0.500M-0.250M (Budgeted)			
3) Annual Operating Cost:	**$2.700M-$2.625M US**			
VPN Tunneling (Per Annum)	0.150M-0.100M (Estimated)			
Messaging Translation Tool (Per Annum)	0.050M-0.025M (Budgeted)			
DEU Platform Licensing (Per Annum)	1.000M-1.000M (Contracted)			
Corporate Administration (Administrative NGO)	1.500M-1.500M (Budgeted)			
• **REGIONAL ENABLING UNIT (AEU) PER ANNUM COSTS**		**$2.316M-$1.658 US**	**$0.463-$0.332 US**	**$0.039-$0.028 US/MO**
1) Technology Acquisition:	**- 0 -**	**- 0 -**	**- 0**	**- 0 -**
2) Engineering:	**$0.566M-$0.258M US**			
• **OPERATIONS:**	**$1.750M-$1.400M US**	**$1.750M-$1.400M US**	**$0.350-$0.280 US**	**$0.029-$0.023 US/MO**
1) System Maintenance:	0.500M-0.250M (Budgeted)			
2) VPN Tunnelling:	0.250M-0.150M (Estimated)			
3) Wireless Operator Compensation:	0.500M-0.500M (Budgeted)			
40 Enabling Utility Licensing:	0.500M-0.500M (Contracted)			

SEC XI: *So* WHO PAYS

AS A MULTIMARKET, NON-REVENUE PUBLIC SERVICE, PROVIDING UPSEN EMERGENCY MESSAGING CAN GENERATE OPERATING REVENUE THROUGH A TELECOM INDUSTRY PUBLIC SERVICE OBLIGATION (PSO) SURCHARGE…

THE PSO SURCHARGE IS CAPPED AT SIXTEEN CENTS (US) PER USER PER MONTH, PER THE UPSEN ENABLING CONTRACT. THIS SURCHARGE MUST FULLY REIMBURSE PARTNERED WIRELESS PROVIDERS FOR SUBSCRIPTION COSTS AND USE OF PRIVATE ASSETS FOR NON-REVENUE PUBLIC BENEFITS.

- **ADDITIONAL FUNDING SOURCES:** THE UN ACTION PLAN CALLS FOR THE INVESTMENTS OF 3.1 BILLION USD OVER FIVE YEARS TO STRENGTHEN THE DISSEMINATION AND COMMUNICATION OF WARNINGS CAPABILITIES AS DEFINED BY '*THE CLIMATE RISK AND EARLY WARNING SYSTEMS* INITIATIVES' AND GLOBAL MULTILATERAL FUNDS INCLUDING *'THE GREEN CLIMATE FUND'* AND THE DEVELOPMENT BANKS. THE UPSEN PROGRAMS DELIVERS THE SYSTEM AND FUNDING MODEL TO ACHIEVE THIS INITIATIVE,

- **ESTIMATED PER ANNUM ENABLING CONTRACTUAL EARNINGS:**

	PER 5M ESU	PER USER	MONTHLY PSO SURCHARGE
ONE YEAR ENABLING CONTRACT BASE:	**9.606M – 7.043M USD**	**$1.921 – $1.409 US**	**$0.160 – $0.117 US ($0.139 US AVG)**
o 1 X 9.606M > 9.606M/YR			
o 1 X 7.043M > 7.043M/YR			
THREE YEAR CONTRACT:	**7.653M – 6.053M USD**	**$1.531 – $1.211 US**	**$0.128 – $0.101 US ($0.114 US AVG)**
o 1 X 9.606M + (2 X 6.677M)= 22.960M ÷ 3 YEARS > 7.653M USD/YR			
o 1 X 7.043M + (2 X 5.558M) = 18.159M ÷ 3 YEARS > 6.053M USD/YR			
FIVE YEAR CONTRACT:	**7.263M – 5.855M USD**	**$1.453 – $1.171 US**	**$0.121 – $0.098 US ($0.109 US AVG)**
o 1 X 9.606M + (4 X 6.677M) = 36.314M ÷ 5 YEARS > 7.263M USD/YR			
o 1 X 7.043M + (4 X 5.558M) = 29.275M ÷ 5 YEARS > 5.855M USD/YR			

SEC XII: *WHAT IS THE* UPSEN DEPLOYMENT PLAN:

THE UPSEN PROGRAM AND ACTIVATION OF THE PERSONAL ALERT EMERGENCY MESSAGING FEATURE IS RESERVED FOR REGULATORY NATIONS THAT ARE PARTICIPATING MEMBERS OF THE UPSEN ADMINISTRATIVE MOBILE ALLIANCE…

ANY NATION HAVING FULLY ASSESSED THE TECHNICAL, ECONOMIC, AND POLITICAL CHALLENGES, AND IS IN AGREEMENT WITH ETWS REPORT TS 123 04 (1) THAT WIRELESS BROADCAST MESSAGING IS THE MOST EFFECTIVE WAY TO DELIVER TIMELY EMERGENCY WARNINGS, MAY REQUIRE THEIR LICENSED PERSONAL TELECOM PROVIDERS TO DEPLOY REVENUE-NEUTRAL UPSEN MESSAGING AS A PUBLIC SERVICE OBLIGATION OF THEIR SPECTRUM LICENSING.

- **DEPLOYMENT PROJECTION:**
  Deploying UPSEN Personal Alerting globally will require the licensed integration of over 700 wireless and satellite networks in more than 200 regulatory countries. Additionally, achieving early warning for all will involve dedicated connectivity to over nine billion telecom devices and eighteen hundred Regional Enabling Units (REU). Wealthy nations that opt to deploy a national wireless warning system, may choose to include cross-border advisories with a 'data-only' connectivity to an UPSEN Regional Enabling Unit.

- **DEPLOYMENT PROCEDURE:**
  UPSEN DEPLOYMENT IS ORGANISED BY ACTIVATION REGIONS, EACH MANAGED BY A SPONSORING NATION RESPONSIBLE FOR PROVIDING INITIAL CONNECTIVITY SERVING ONE MILLION MOBILE USERS. THE SPONSORING RECEIVES COMPENSATION FOR HOSTING THE REGIONAL ENABLING UNITS, AND THE RECRUITMENT OF ADDITIONAL PARTICIPATING NATIONS. Deployment of UPSEN Worldwide Wireless Warning is achieved in five steps:
  - **STEP ONE:** Applicant nations accept accessibility of the UPSEN Personal Alerting feature as offered by the jurisdiction's licensed wireless services providers.
  - **STEP TWO:** REGULATORY AUTHORITIES PERMIT IMPOSITION OF THE PSO COST RECOVERY SURCHARGE/SURTAX ON THE JURISDICTIONAL MARKET CONNECTED USERS,
  - **STEP THREE:** The UPSEN Alliance negotiates with host nation wireless operators to establish the agreed Enabling Subscription terms:
    Determine wireless provider broadcast requirements,
    Amortize UPSEN subscription cost over the contracted service term,
    Define content and coverage,
    Specify network engagement terms,
    Set establishment timeline,
  - **STEP FOUR:** Host nations must instruct wireless providers to grant the UPSEN One World Mobile Alliance access and use of required network management data and spectrum, under the direct supervision of the wireless provider members.
  - **STEP FIVE:** Broadcast system partners are granted opt-in interface to the UPSEN Personal Alert Enabling Systems Platform in accord with the terms established by an agreed UPSEN Enabling Subscription Agreements.

- **Regional Deployment Structure:**
  Each Deployment Region will require the designation of a Primary Nation
  - Must provide a minimum of five million regional connected users
  - Will host the regional Dedicated Enabling Units
  - Will be compensated for securing additional UPSEN Participating Nations

- **Phase I Primary Deployment Regions:**
  Phase One regions consist of the "GAP" nations and are targeted for deployment by 2027…
  - **Western Africa:**
    (477M Connected Users) (54 MNOs) (87 UPSEN Units)
  - **Southeast Asia:**
    (2020M Connected Users) (74 MNOs) (404 UPSEN Units)
  - **Caribbean Region:**
    (33M Connected Users) (39 MNOs) (6 UPSEN Units)
  - **North Africa Middle East Region:**
    (611M Connected Users) (70 MNOs) (112 UPSEN Units)
  - **West European Region:**
    (461M Connected Users) (70 MNOs
  - **Latin America Region:**
    (670M Connected Users) (22MNOs) (134 UPSEN Units)
  - **Europe:**
    (126M Connected Users) (51 MNOs) (26 UPSEN Units)