phocos

Capacity Development Seminar On Providing Access To Afordable, Reliable, Sustainable and Modern Energy For Isolated Poor Communities

1. *PHOCOS AT A GLANCE*

2. ENERGY, SITUATION IN LATIN AMERICA

3. TECHNOLOGICAL SOLUTIONS

4. PLANNING IN RURAL ELECTRIFICATION

5. EXPERIENCE WITH MUNICIPIOS

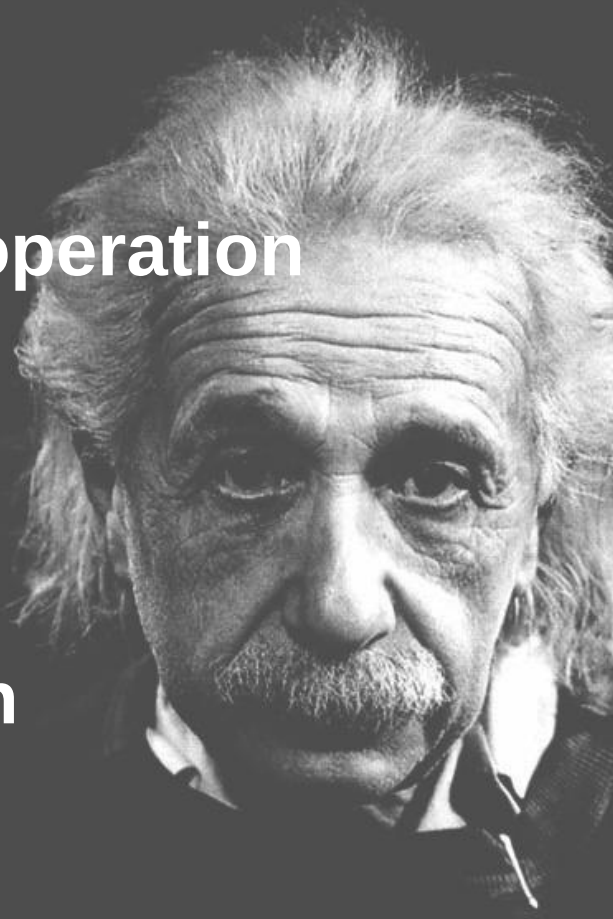
6. MICROENTREPREUNEURS AND SOCIAL MICROENTREPREUNEURS

Phocos – at a Glance

PHOCOS was founded in base a cooperation with ULM University in 2000.

Specialized in Off-Grid Systems

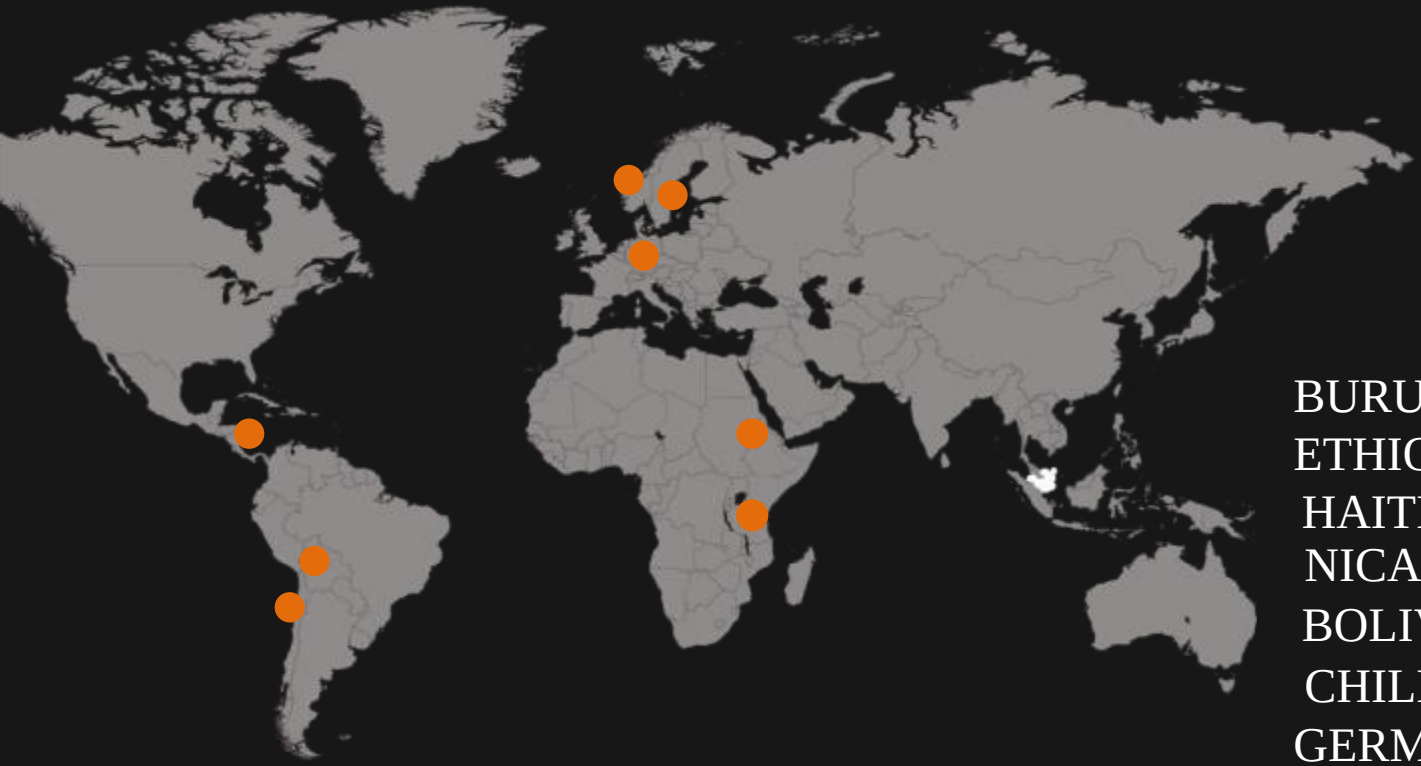
Production: Charge controllers, high Efficient lamps.



Worldwide presence

Headquarter: ULM-Germany
Manufacturing Centers: China-India-Bolivia

Gross National Product



BURUNDI	267 $us
ETHIOPIA	556 $us
HAITI	800 $us
NICARAGUA	1.851 $us
BOLIVIA	2.867 $us
CHILE	15.738 $us
GERMANY	46.251 $us
SWEEDEN	8.380 $us
NORWAY	100.898 $us

LAS FAMILIAS Y EL MECHERO

- FIRE RISKS
- DAMAGE TO HEALTH
- LOW EDUCATION LEVELS
- NO FAMILIAR INTEGRATIÓN (DAYS ENDS AT SUNSET)
- HIGH EXPENSES IN CANDELS, DIESEL AND BATERIES
- LIMITATION IN CELULAR AND RADIO COMUNICATION

- **LATIN AMERICA, 30 MILLIONS PERSONS WITHOUT ACCESS TO ELECTRICITY.**

- **IS IT POSIBLE TO REACH THE UNIVERSAL ACCESS TO ENERGY BY 2030?**

HOW…?

SOME NECCESARY CONDITIONS

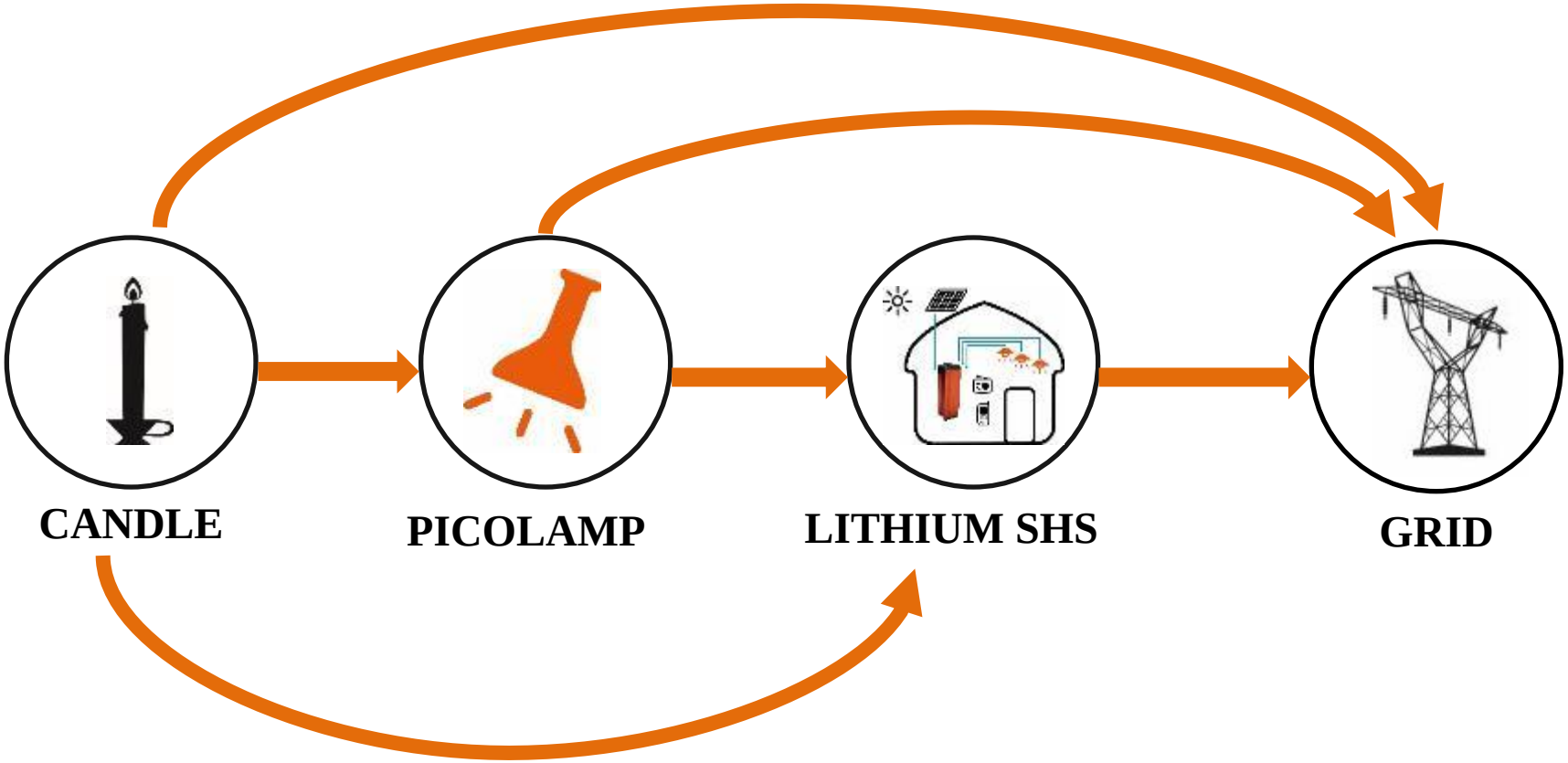
1. POLITICAL DECISION
2. AVAILIBITY OF THE TECHNOLOGYE
3. TO KNOW WHERE TO GET THE FINANTIAL ISSUES
4. TO FIND THE MODEL FOR IMPLEMENTATION

IN BOLIVIA, 500.000 families without Electricity
AGENDA 2025: Universal Access for Basic Services

Points 1,2,3 OK
Point 4: ????

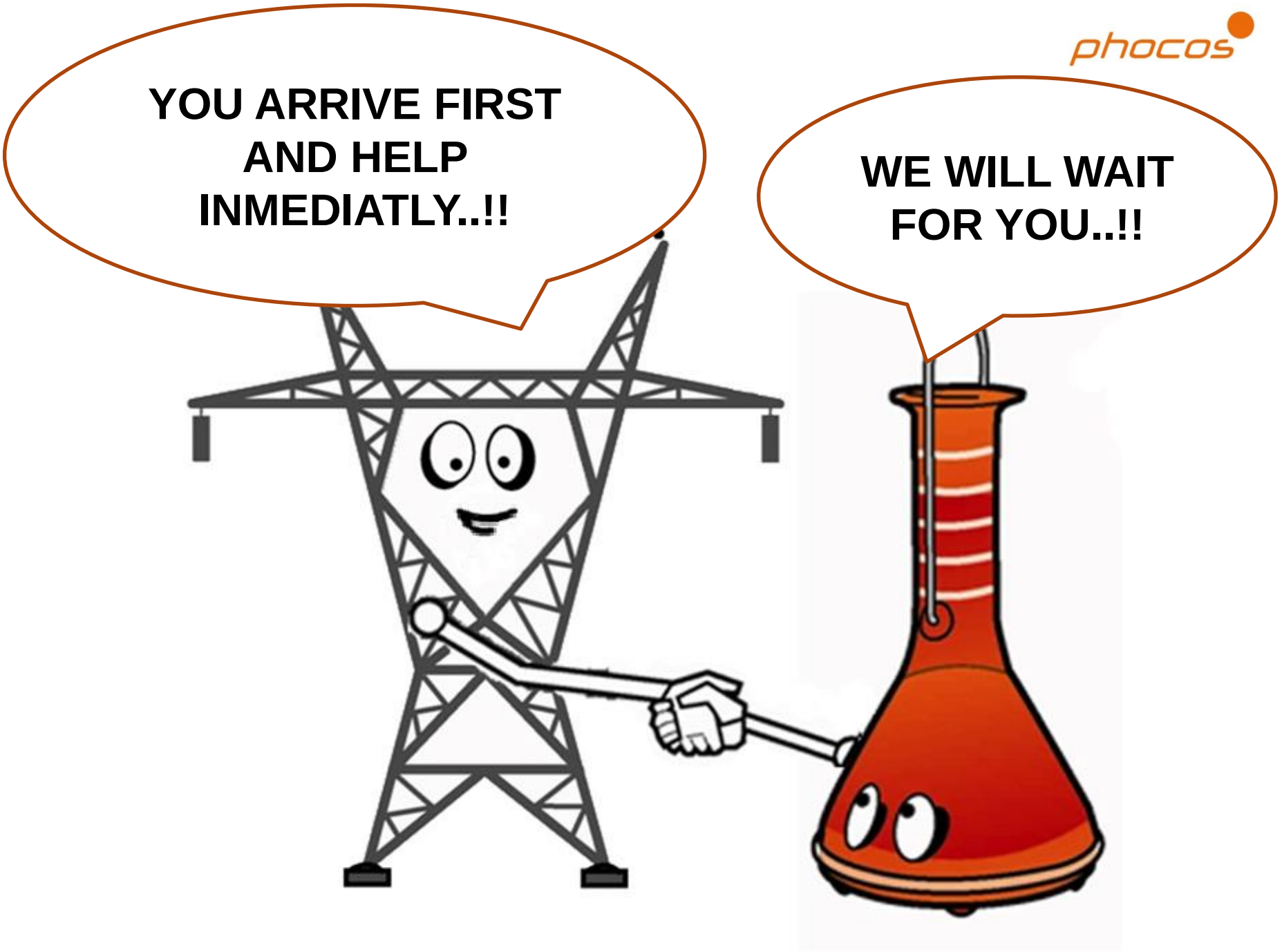
UNIVERSAL ACCESS TO ENERGY….
WHAT IS IT POSIBLE…?

LUCES NUEVAS
FUNDACIÓN

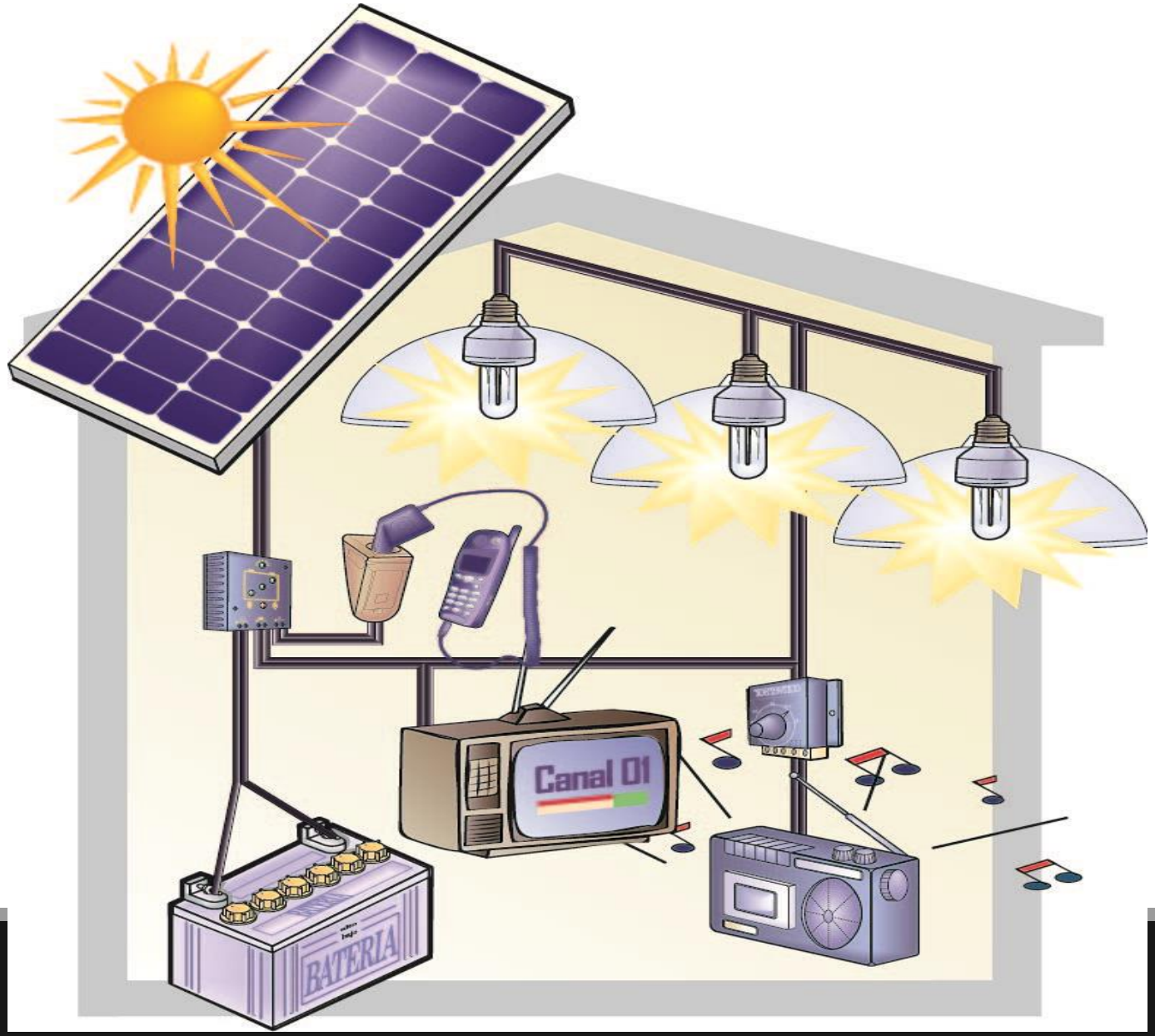


PICOLAMP….FIRST STEP OF THE SOLUTION

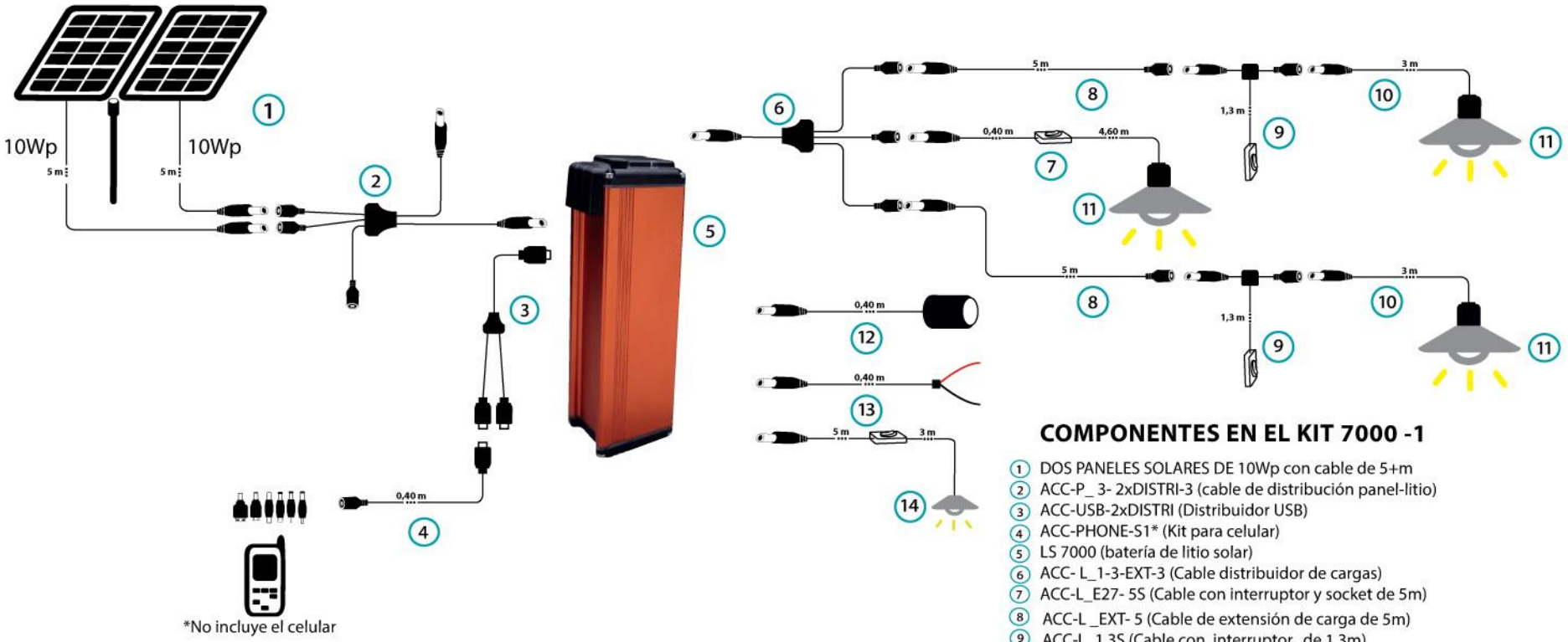
phocos



TRADITIONAL SYSTEMS (1990-2013)



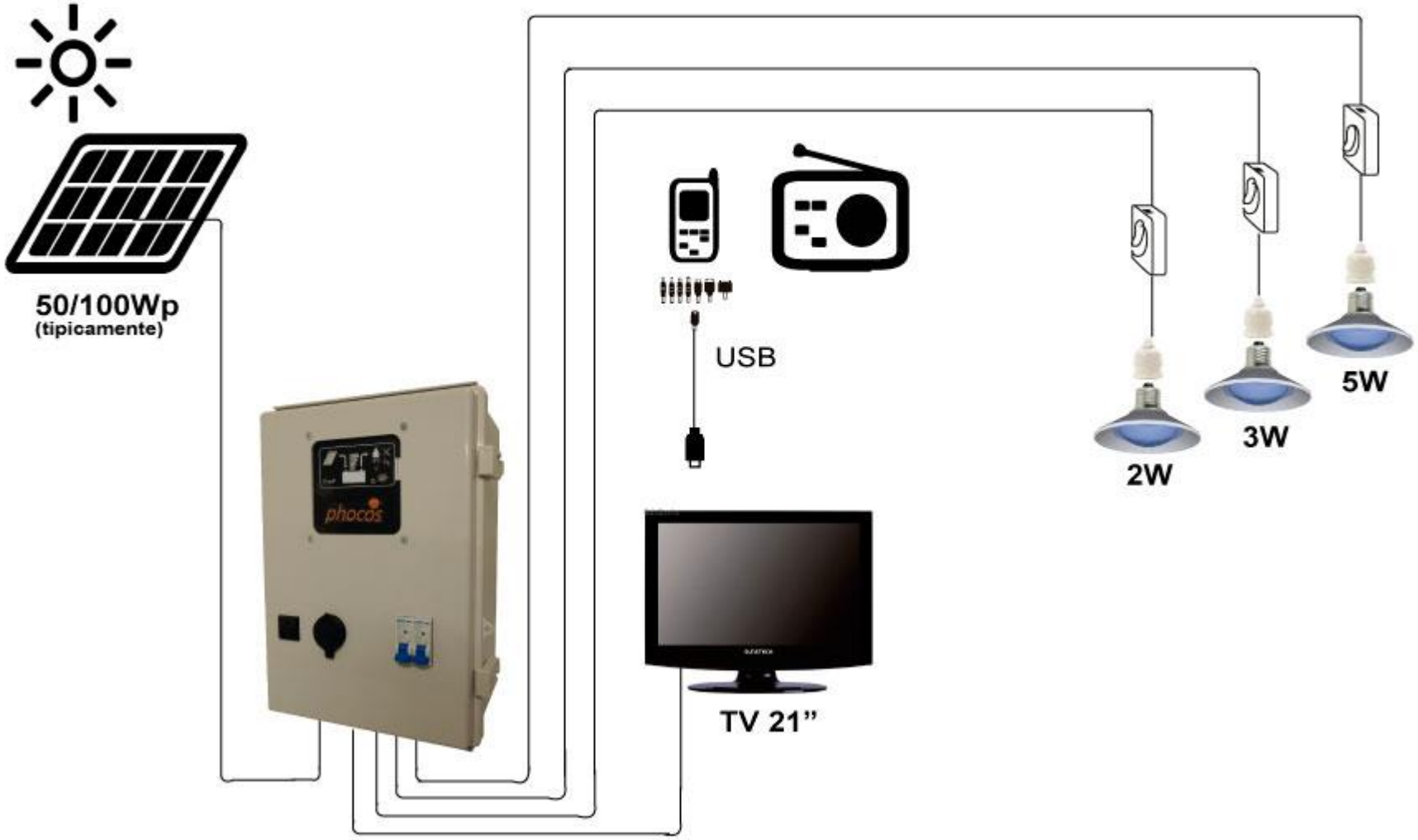
NEW TENDENCY….LITHIUM-LED SYSTEMS



COMPONENTES EN EL KIT 7000 -1

1. DOS PANELES SOLARES DE 10Wp con cable de 5+m
2. ACC-P_ 3- 2xDISTRI-3 (cable de distribución panel-litio)
3. ACC-USB-2xDISTRI (Distribuidor USB)
4. ACC-PHONE-S1* (Kit para celular)
5. LS 7000 (batería de litio solar)
6. ACC- L_1-3-EXT-3 (Cable distribuidor de cargas)
7. ACC-L_E27- 5S (Cable con interruptor y socket de 5m)
8. ACC-L _EXT- 5 (Cable de extensión de carga de 5m)
9. ACC-L_1.3S (Cable con interruptor, de 1,3m)
10. ACC-L_E27-3 (Cable con socket de 3m)
11. LÁMPARAS LED (3W,3W,2W)
12. ACC-L_CAR-1(Cable tipo cigarrera para cargas de 12v de 0,40 m)
13. ACC-L_ 0.4 (Cable para otras cargas de 0,40m)
14. LED MINI SUNFLOWER 0.25W (12v y cable de 8m)

MORE POWER with Lithium…UP TO 500 Wh

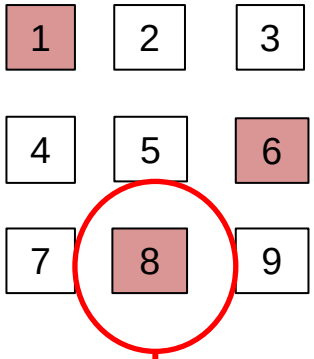



LAPHIA

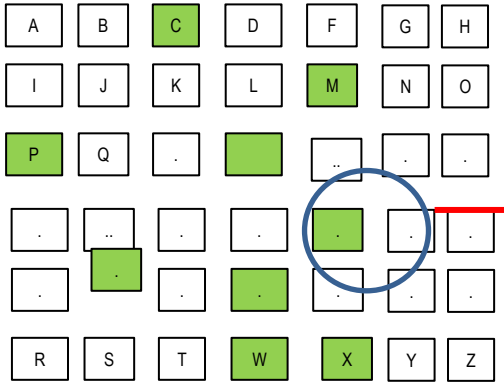
CLASICAL MODEL OF "PLANIFICATION" IN ENERGY

"BY DEMMAND"

Bolivia, 9 departaments

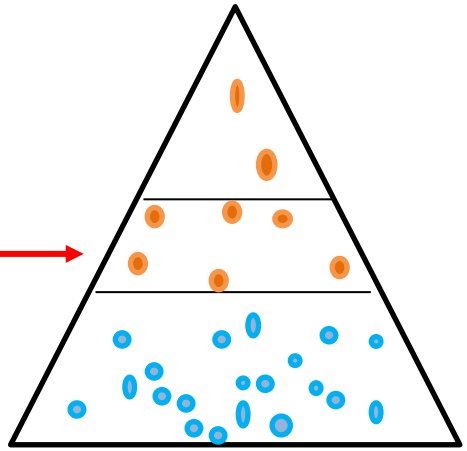


Municipios



SOLUTIONS Not for all the Municipes

Families



SOLUTIONS Not for all the families

WHY THE ENERGY PLANNING, ORIENTED TO THE UNIVERSAL ACCESS

THE PROBLEM

3650 NIGHTS WITHOUT LIGHT

TO HAVE A PLAN HELPS:

- ***To Prevent overlappings***
- ***To Analize options***
- ***To Organize the growing***
- ***To Decide investions***
- ***To Optimize services***

PLANNING IN RURAL ELECTRIFICATION

1. Let us to know the cost of implementation of the Universal Access to Energy

2. Allow to define the technical solution in function of the time, without overlappings

1. Is posible to reach a goal in an specific period of time.

CRITERIA TO SELECT THE TECHNOLOGIE FOR THE UNIVERSAL ACCESS (DENSIFICATION, GRID EXTENSION, SOLAR ENERGY, OTHERS)

1. DISTANCE TO THE ACTUAL EXISTING GRID

2. COST OF THE INVESTION PER FAMILY (DIFFERENT TECHNICAL OPTIONS)

3. GEOPOLITICAL CONSIDERATIONS

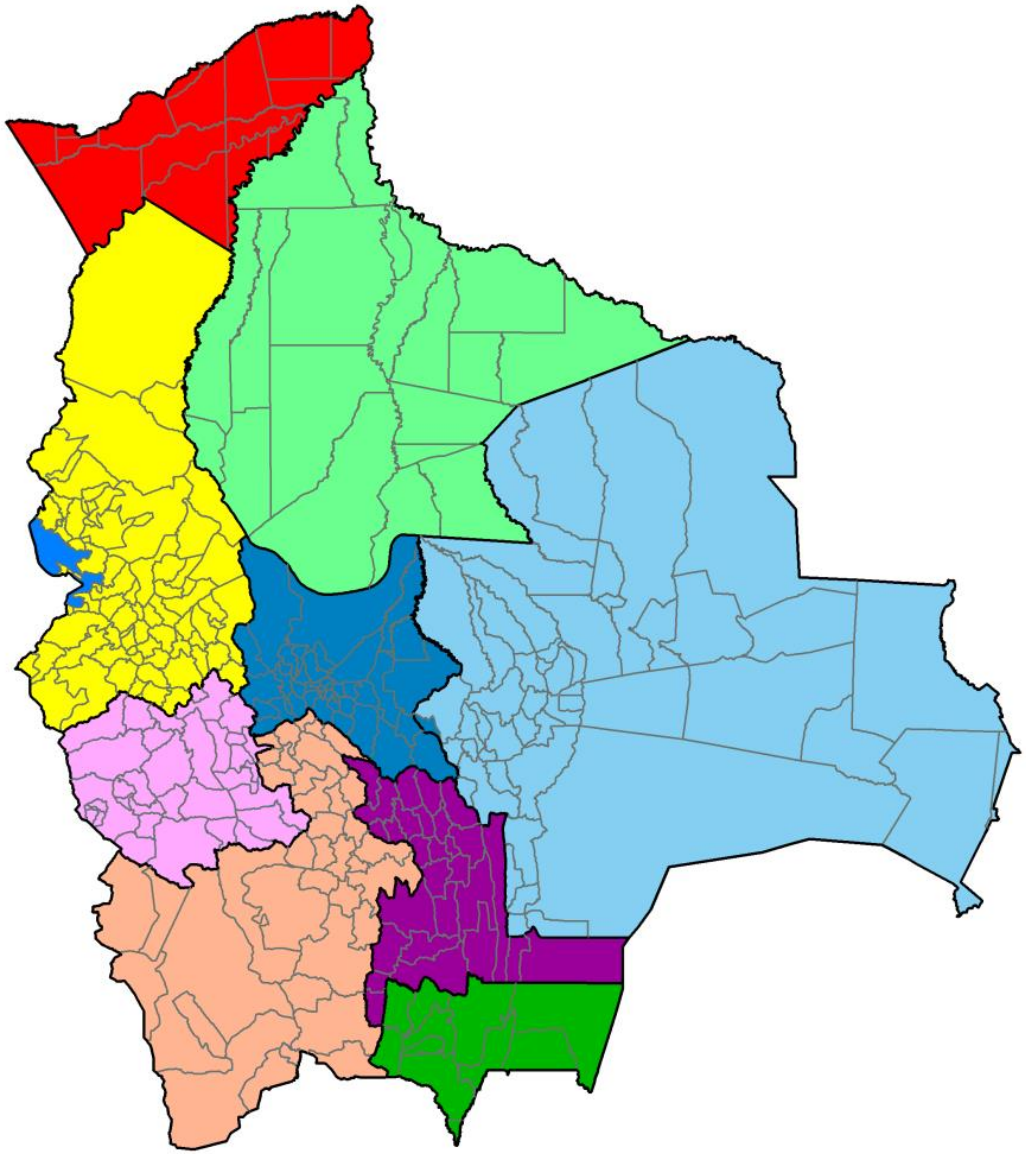
Strategic Plan of Rural Electrification

OBJETIVE:

TO PROPOSE INSTRUMENTS FOR REACHING THE UNIVERSAL ACCESS TO ENERGY BY 2025 IN BOLIVIA.

Political Division

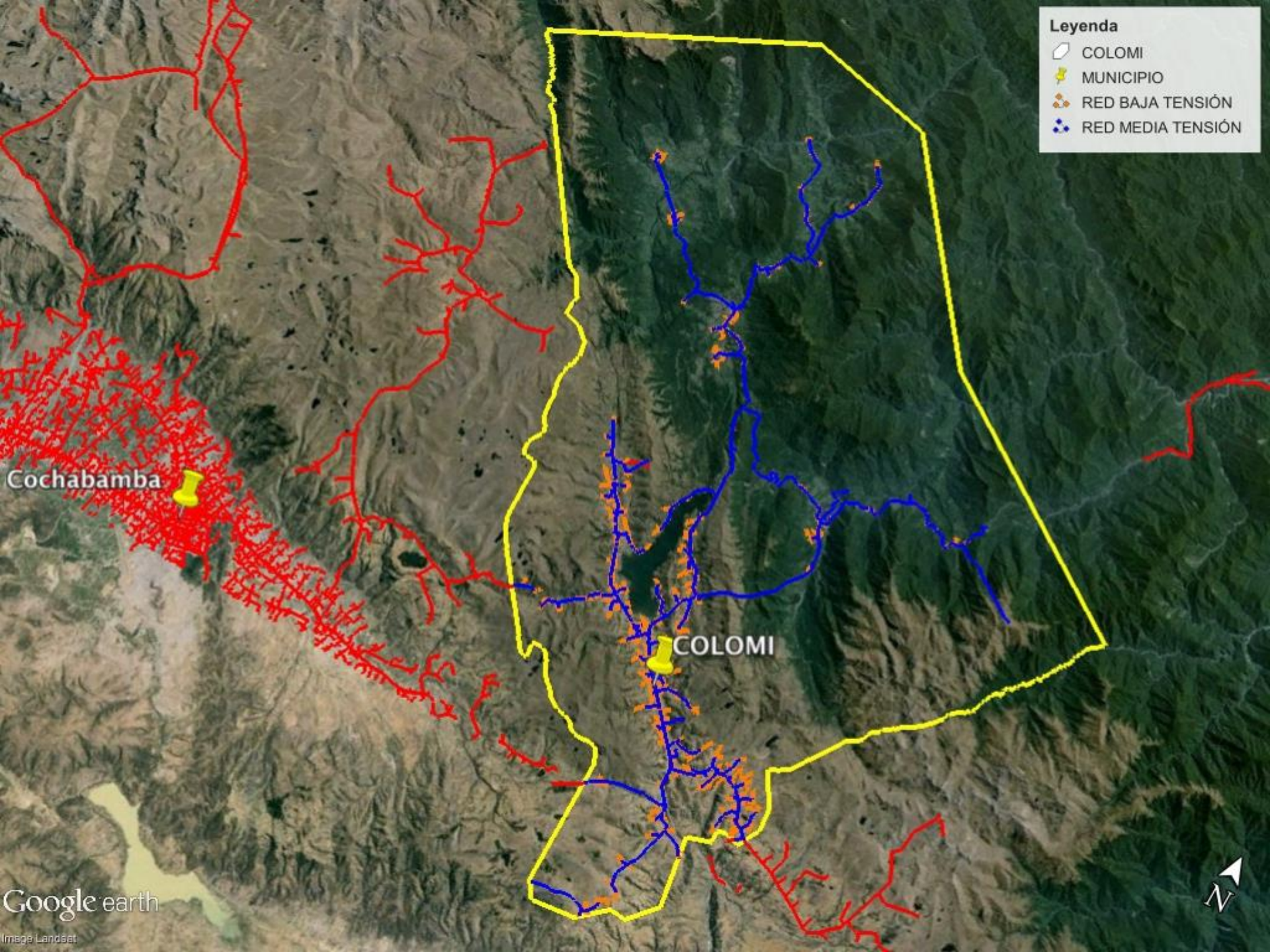
- 9 Departaments or Cities
- 339 Municipalities



DESIGNING THE PLAN

COORDINATION WITH:

- **LOCAL POLITICAL AUTORITHIES**
- **COMMUNITARY AUTORITHIES**
- **FAMILIES**
- **TEACHERS**


Leyenda
COLOMI
MUNICIPIO
RED BAJA TENSIÓN
RED MEDIA TENSIÓN
Cochabamba
COLOMI
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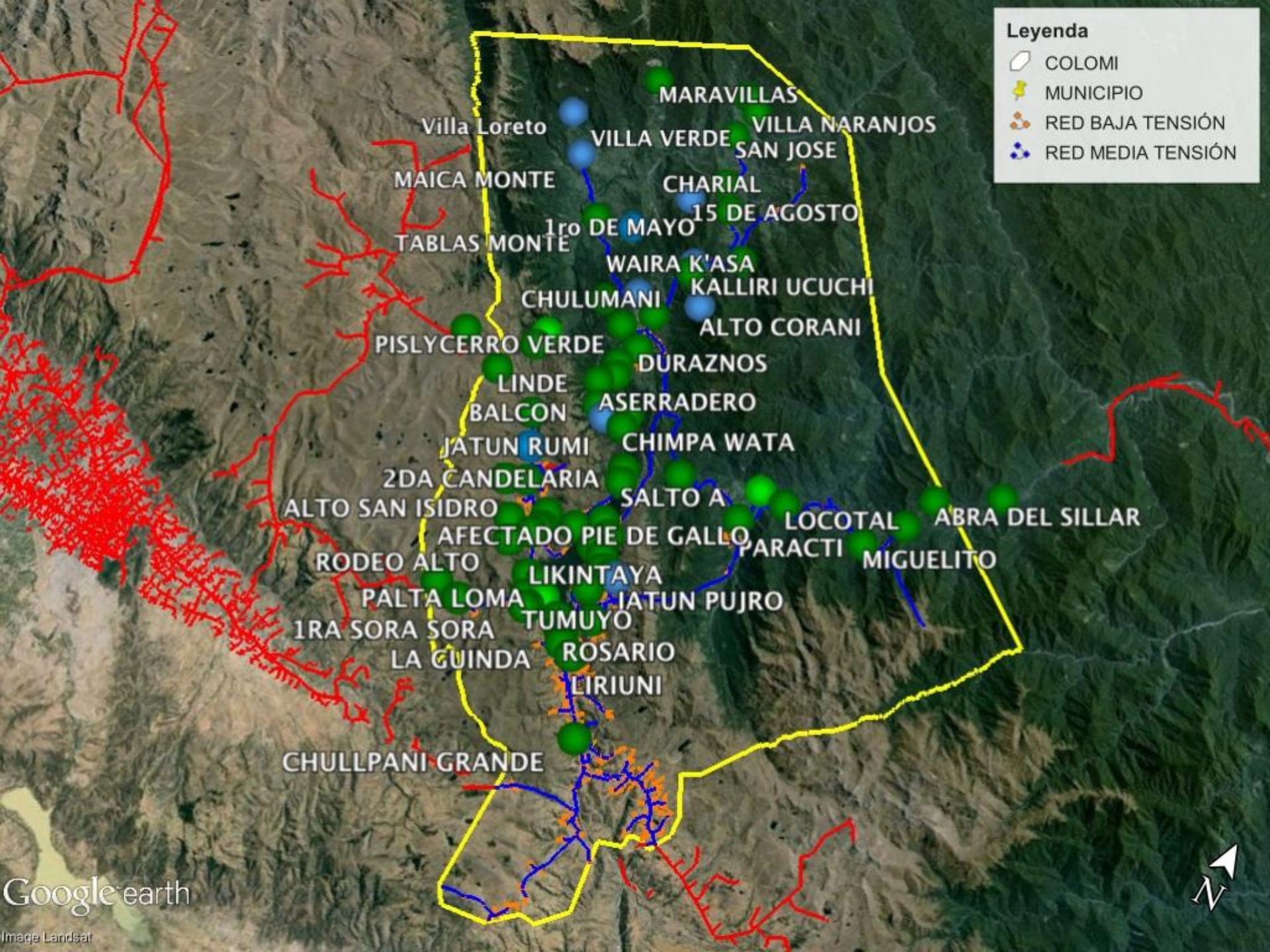
Leyenda
COLOMI
MUNICIPIO
RED BAJA TENSIÓN
RED MEDIA TENSIÓN
MARAVILLAS
Villa Loreto
VILLA VERDE
VILLA NARANJOS
SAN JOSE
MAICA MONTE
CHARIAL
15 DE AGOSTO
1ro DE MAYO
TABLAS MONTE
WAIRA K'ASA
KALLIRI UCUCHI
CHULUMANI
ALTO CORANI
PISLYCERRO VERDE
DURAZNOS
LINDE
ASERRADERO
BALCON
JATUN RUMI
CHIMPA WATA
2DA CANDELARIA
SALTO A
ALTO SAN ISIDRO
LOCOTAL
ABRA DEL SILLAR
AFECTADO PIE DE GALLO
PARACTI
MIGUELITO
RODEO ALTO
LIKINTAYA
PALTA LOMA
JATUN PUJRO
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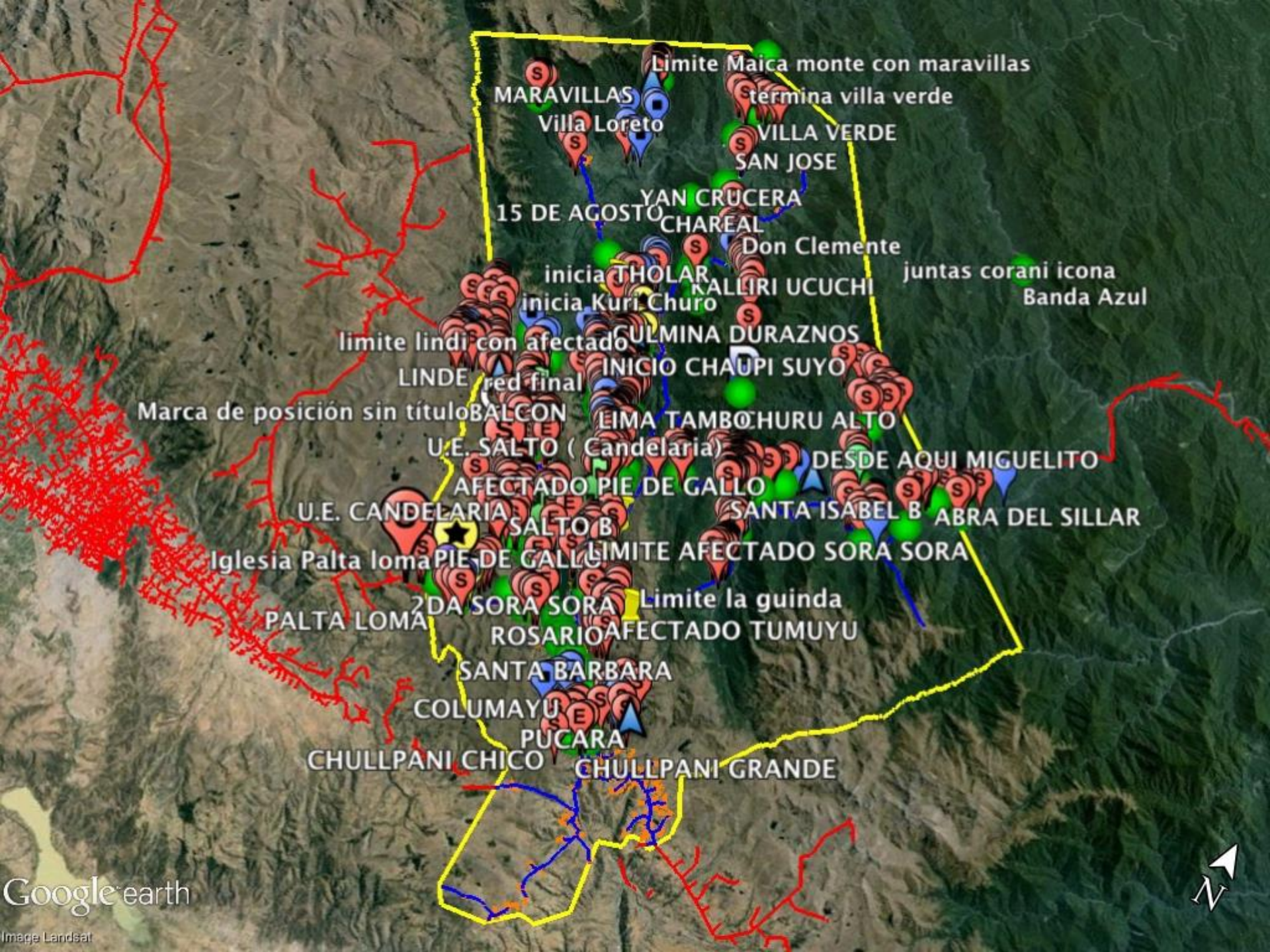
Limite Maica monte con maravillas
MARAVILLAS
termina villa verde
Villa Loreto
VILLA VERDE
SAN JOSE
YAN CRUCERA
15 DE AGOSTO
CHAREAL
Don Clemente
inicia THOLAR
juntas corani icona
KALLIRI UCUCHI
Banda Azul
inicia Kuri Churo
CULMINA DURAZNOS
limite lindi con afectado
INICIO CHAUPI SUYO
LINDE
red final
Marca de posición sin título
BALCON
LIMA TAMBO
CHURU ALTO
U.E. SALTO (Candelaria)
DESDE AQUI MIGUELITO
AFECTADO PIE DE GALLO
U.E. CANDELARIA
SANTA ISABEL B
ABRA DEL SILLAR
SALTO B
Iglesia Palta loma
PIE DE GALLO
LIMITE AFECTADO SORA SORA
2DA SORA SORA
Limite la guinda
PALTA LOMA
ROSARIO
AFECTADO TUMUYU
SANTA BARBARA
COLUMAYU
PUCARA
CHULLPANI CHICO
CHULLPANI GRANDE
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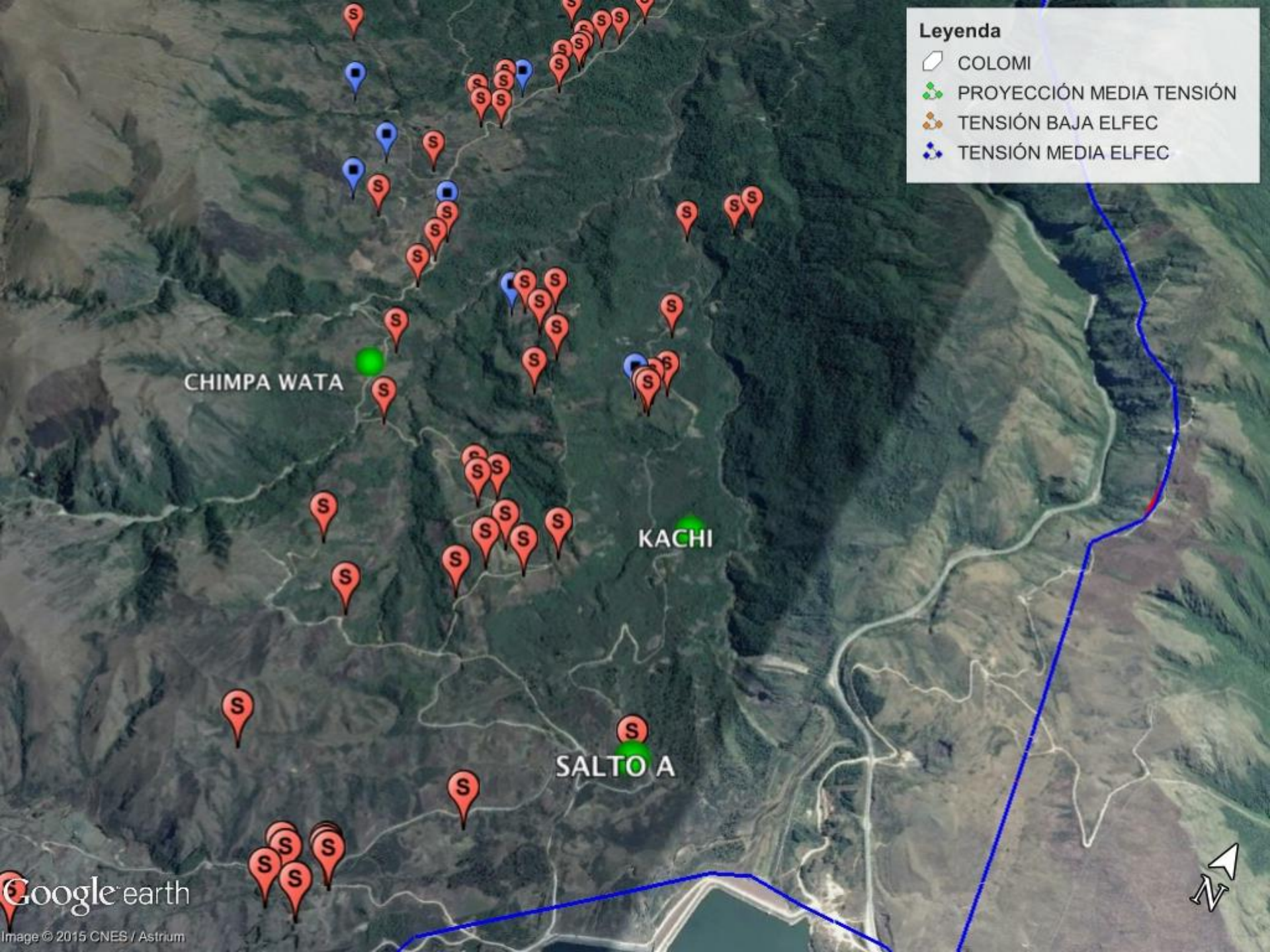
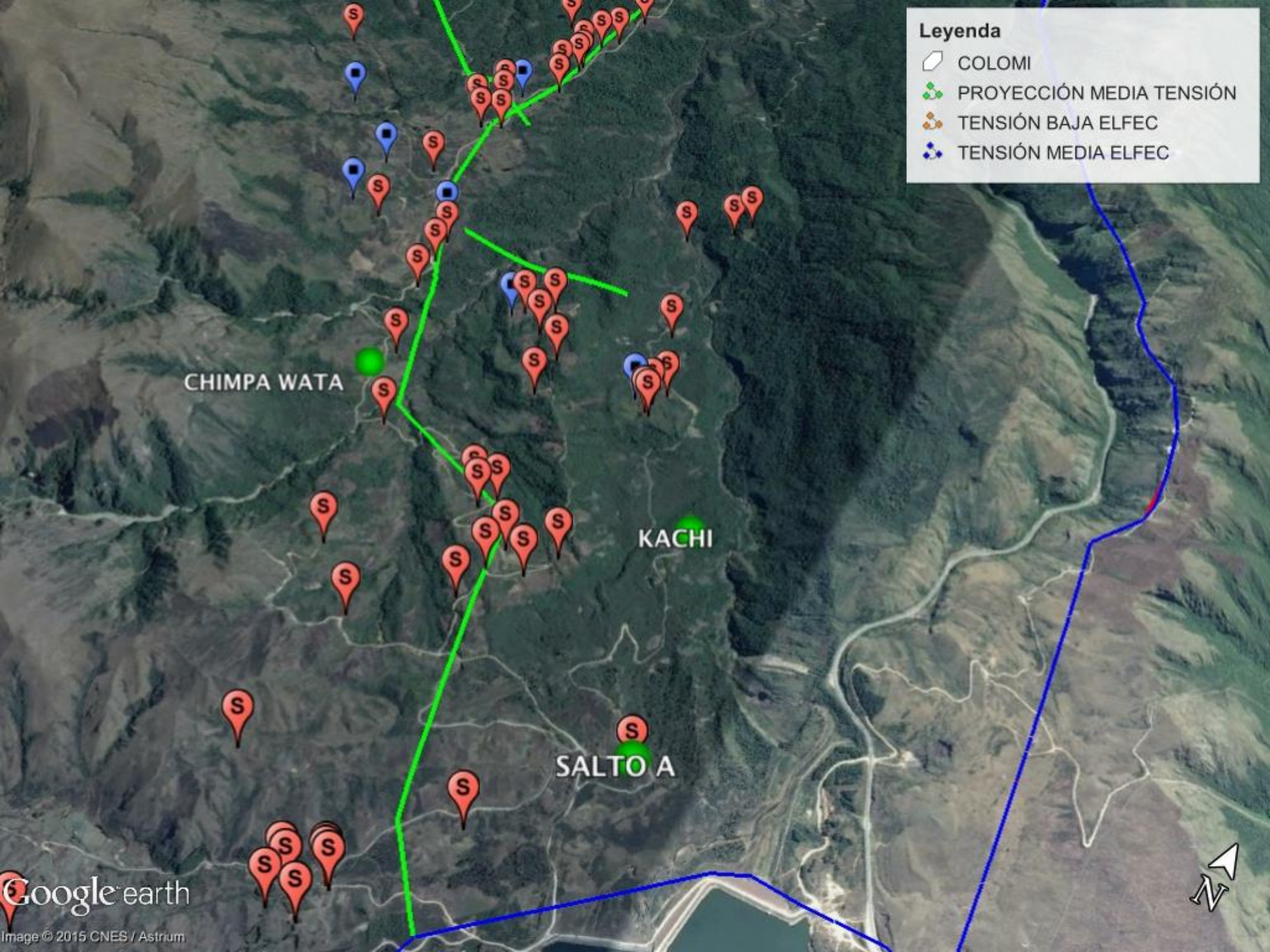

Leyenda
COLOMI
PROYECCIÓN MEDIA TENSIÓN
TENSIÓN BAJA ELFEC
TENSIÓN MEDIA ELFEC
CHIMPA WATA
KACHI
SALTO A
N
Google earth
Image © 2015 CNES / Astrium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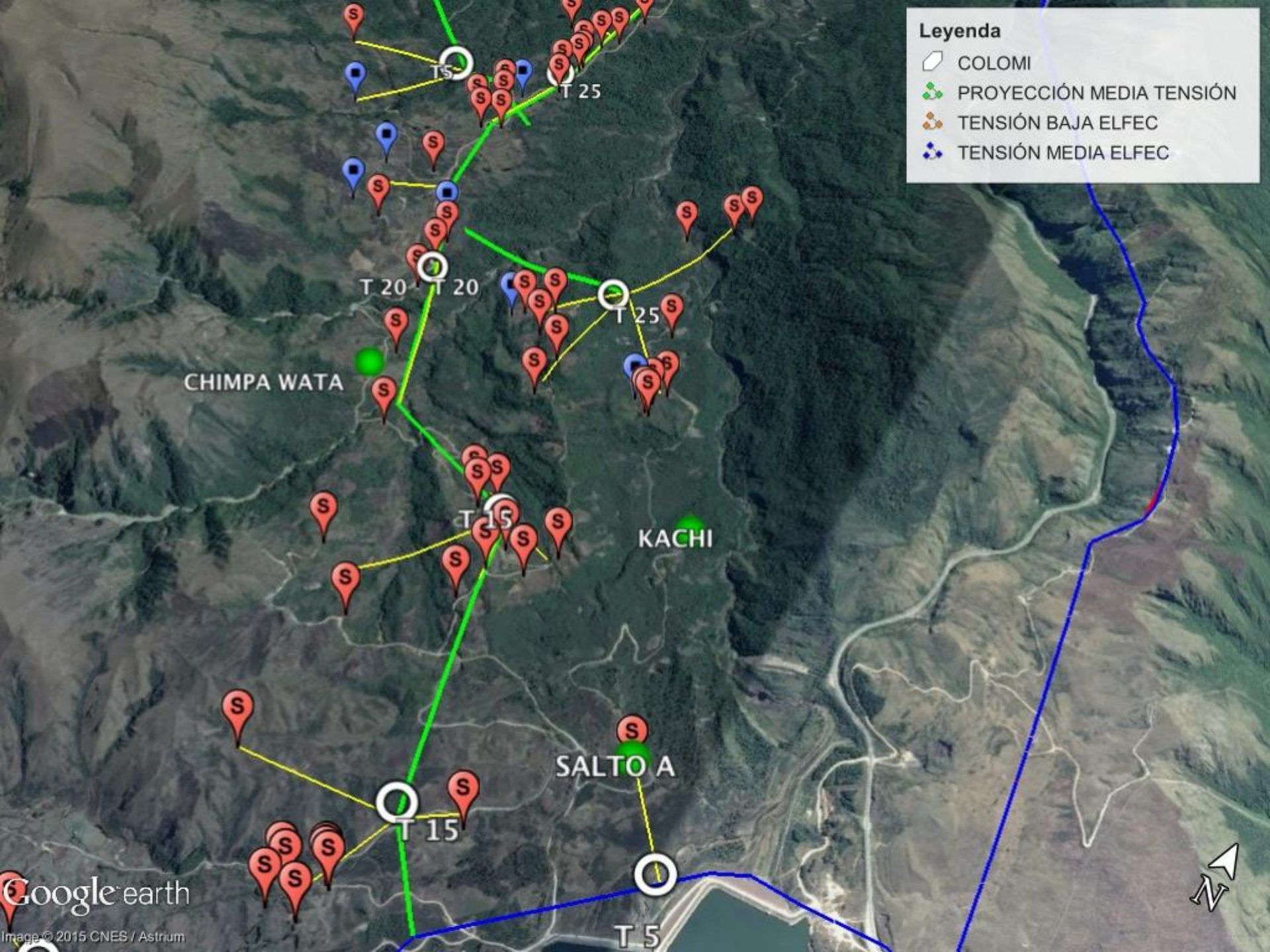
Leyenda
COLOMI
PROYECCIÓN MEDIA TENSIÓN
TENSIÓN BAJA ELFEC
TENSIÓN MEDIA ELFEC
T5
T 25
T 20
T 20
T 25
CHIMPA WATA
T 15
KACHI
SALTO A
T 15
T 5
Google earth
Image © 2015 CNES / Astrium
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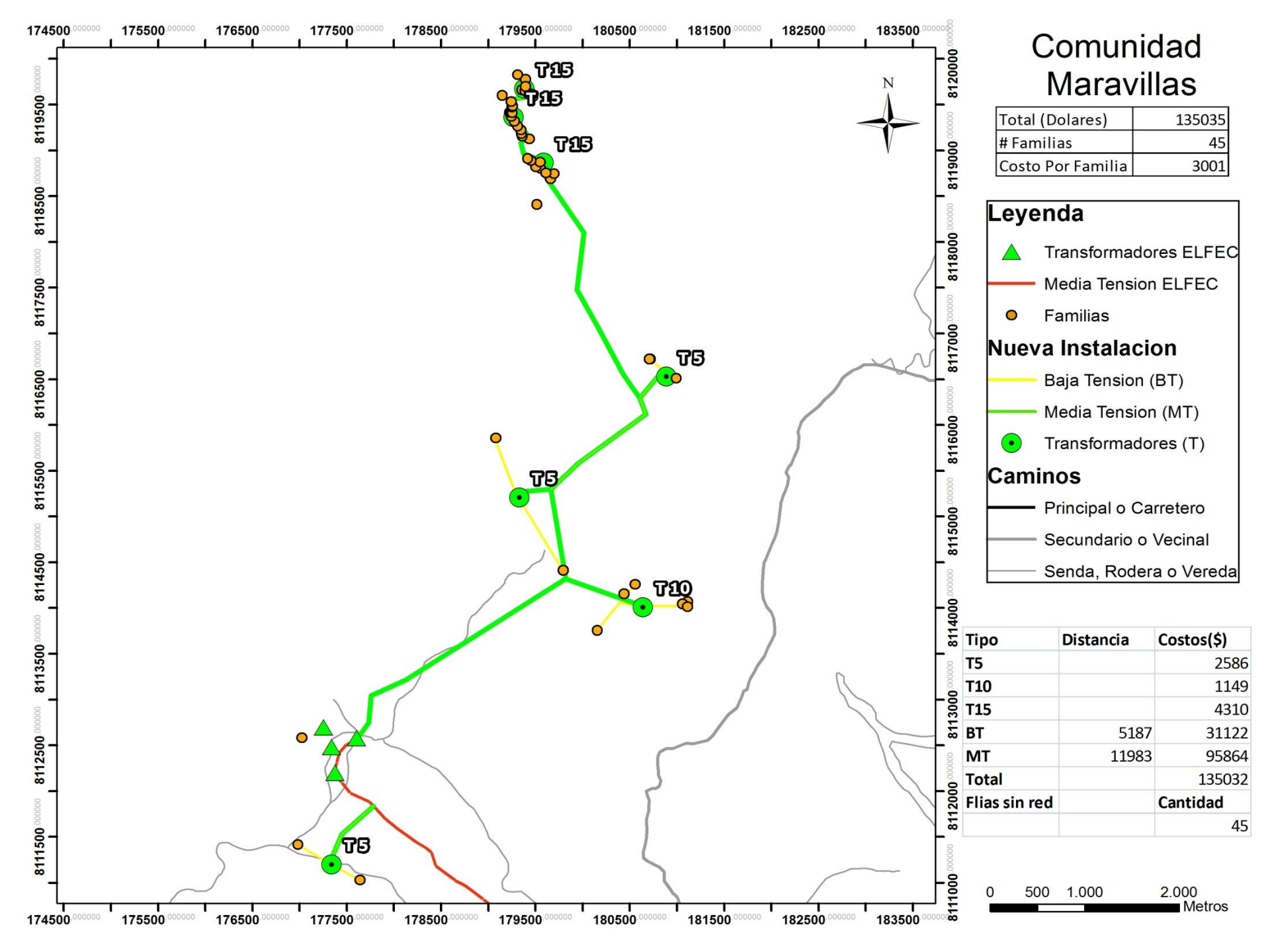
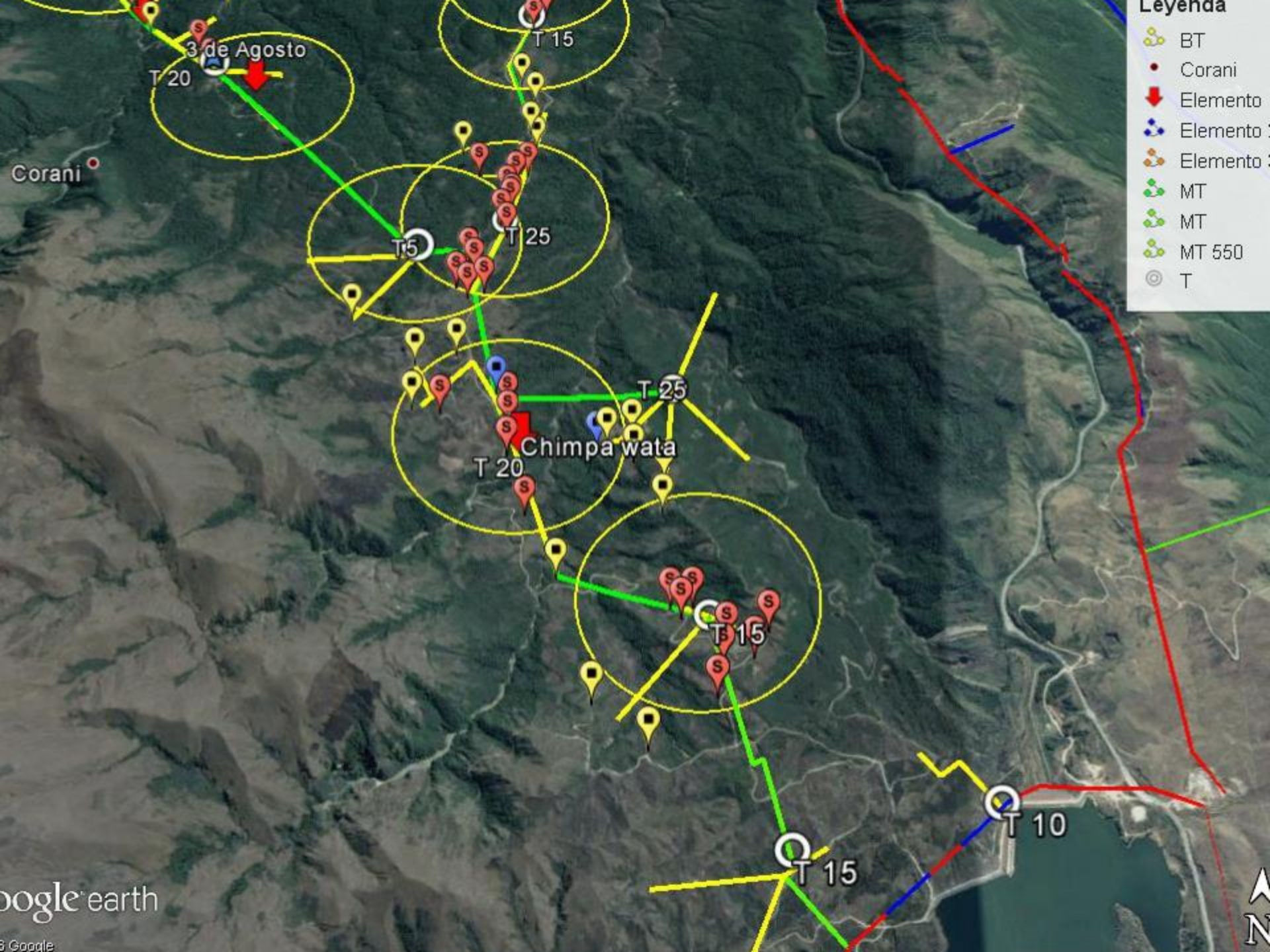


Tipo	Distancia	Costos($)
T5		2586
T10		1149
T15		4310
BT	5187	31122
MT	11983	95864
Total		135032
Flias sin red		Cantidad
		45


Leyenda
BT
Corani
Elemento
Elemento
Elemento
MT
MT
MT 550
T
3 de Agosto
T 20
T 15
Corani
T5
T 25
T 25
Chimpa wata
T 20
T 15
T 10
T 15
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UNIVERSAL ACCESS WITH GRID (REQUIRED MATERIALS)

	QTY
MEDIUM VOLTAJE WIRE	151.759 mts
LOW VOLTAGE WIRE	121.427 mts
TRANSFORMERS 14.4KV/230	150 units.
TOTAL	**2.791.200 $US**

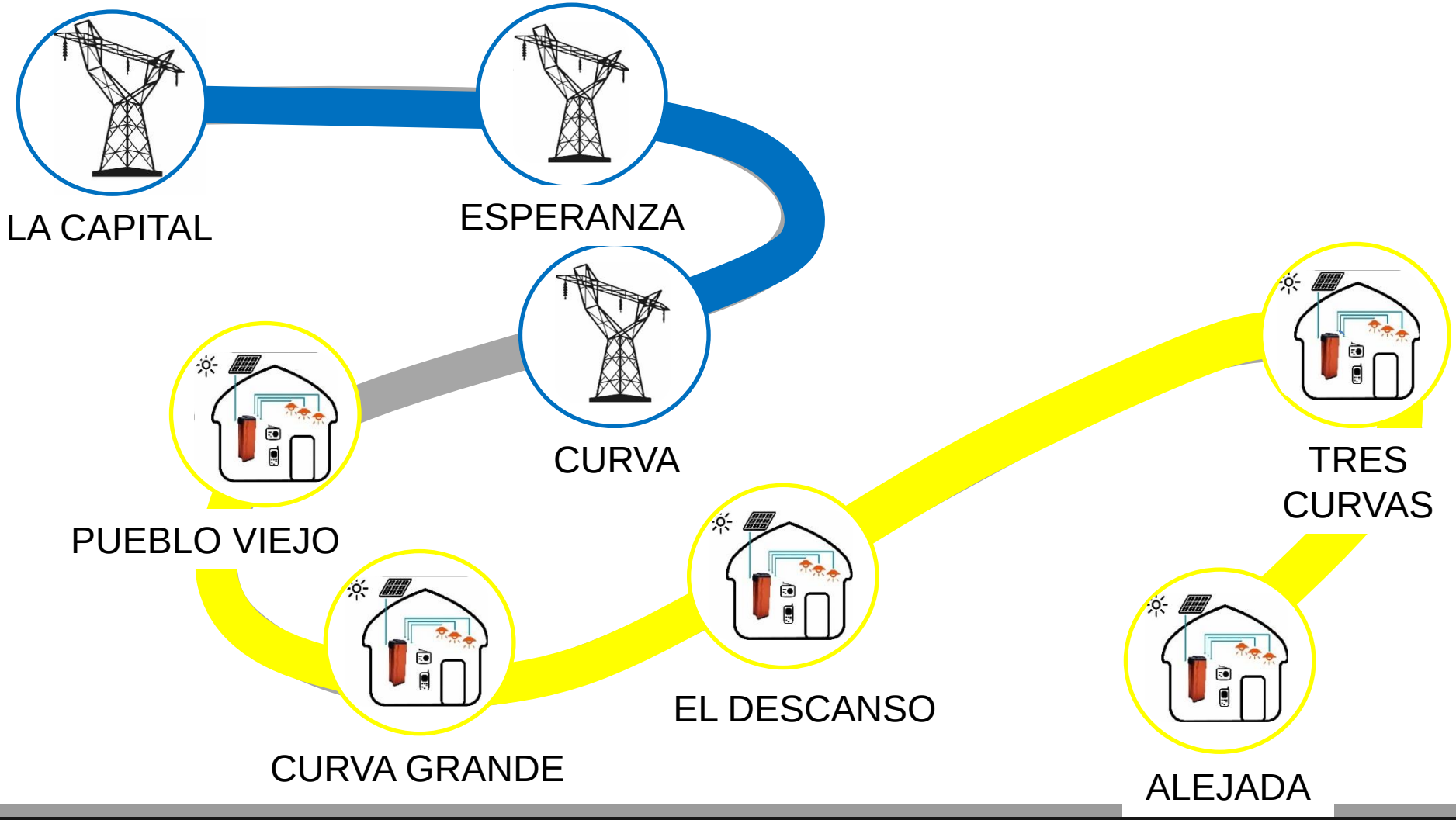
Municipio of COLOMI in numbers

FAMILIES with electricity	5400
FAMILIES without electricity	1561
REQUIRED INVESTION TO REACH UNIVERSAL ACCESS	2.8 MUS$

IF THE MUNICIPIO OF COLOMI RESERVES 16% OF THEIR ANNUAL BUDGET EACH YEAR, CAN REACH THE UNIVERSAL ACCESS

While waiting the grid (9 years), is neccesary to have transitorie solutions (picolamps, lithio, etc)

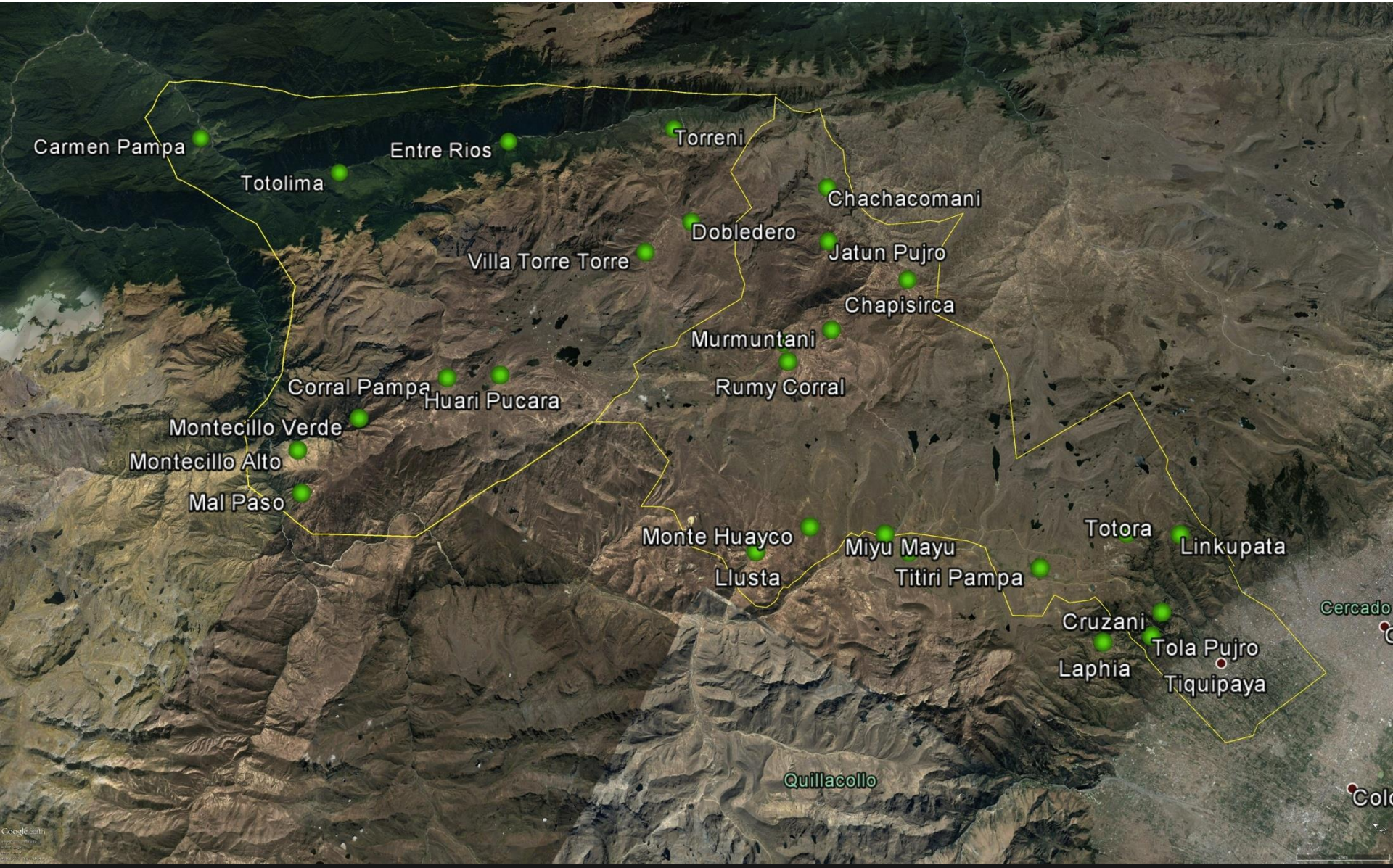
PROCESS UNIVERSAL ACCES TO THE ENERGY



FASE VI: MUNICIPIO COLOMI

COMUNIDAD	CENSO 2012	GOBERNACIÓN (POR DEMANDA)	LUCES NUEVAS (POR PLANIFICACIÓN)		
			TOTAL FAM SIN RED	BENEFICIADAS	SIN BENEFICIARSE POR REGLAMENTACIÓN-COSTO
VILLA JORDAN	26	46	24	18	6
VILLA GRANADOS	6	42	23	23	0
VILLA VERDE	18	32	23	21	2
3 DE AGOSTO	12	29	6	6	0
AGUADA MONTE	35	54	40	32	8
ASERRADERO	44	51	36	34	2
CHAUPI SUYU	27	68	38	26	12
CHIMPA WATA	31	32	27	14	13
LIMA TAMBO	15	9	10	4	6
CHULLPANI	45	38	27	21	6
PAMPA TAMBO	24	24	24	17	7
SANTA ISABEL	216	27	66	62	4
KAYARANI	22	7	30	30	0
KÓCHA GOCHA	11	16			
JATUN P´UJRU	13	26	37	37	0
PICO CENTRAL	10	8			
YANA K´OCHA	12	8			
PALTA LOMA	27	17	16	16	0
PYSLI	28	31	24	23	1
MARAVILLAS GRANDE	29	37	29	29	0
TOTAL FAMILIAS	**671**	**602**	**480**	**413**	**67**

BEGINING THE PROCESS: IDENTIFYING COMMUNITIES



SOCIAL MICROENTREPRENEUR:

NEXT GENERATION OF THE MICROENTREPRENEURS


punto solar
"CHISPAS"
VILLA 14 DE SEPTIEMBRE
SISTEMAS DE ENERGIA SOLAR
DISTRIBUCION
ASESORAMIENTO
INSTALACIONES
pico lámpara
phocos


phocos
PICO
Lámpara LED
ámparas solares de PHOCOS ...
phocos

MICROENTREPREUNER

- Speaks an promote to one family
- Sells technical solutions
- Must have good skills in sellings
- Limited social Impact

SOCIAL MICROENTREPREUNER

- Speaks with a community or autorithies
- Discuss the energy problems with the community
- Good skills in sellings and able to connect to people in community
- Big Social impact, the technical solutions will be implemented with trust (small, medium, large systems). Better conditions to reach Universal Access

MICROENTREPREUNER

- Limited economical incomes

- More visits, posible more sellings, but too expensive

The country shows advances in numbers without understanding the needs

SOCIAL MICROENTREPREUNER

- Better conditions to remain in the economical circuit

- More technified visits to communities, Better conditions to reach Universal Access

MUST BE A PART OF THE UNIVERSAL ACCESS PROCESS…..

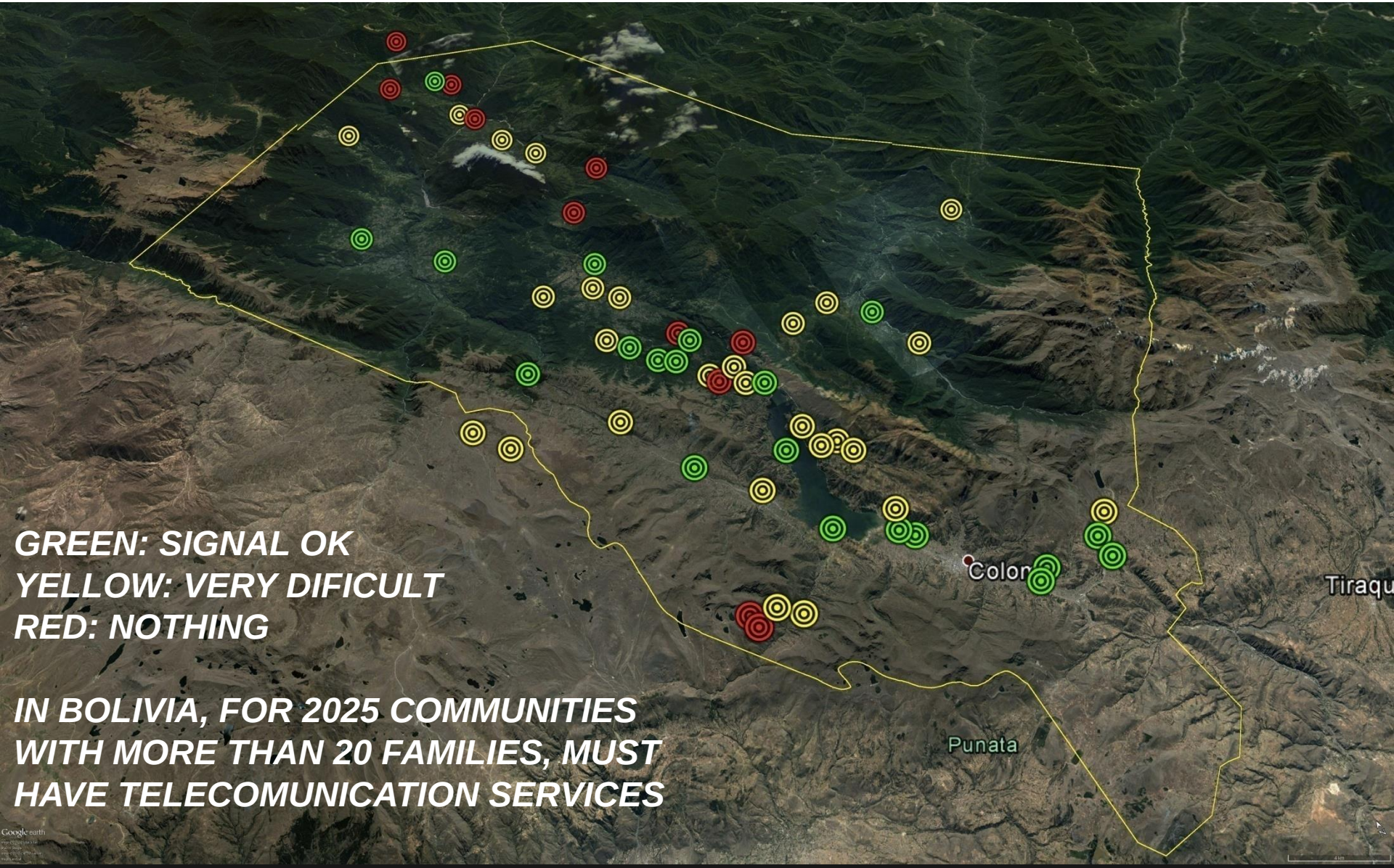
MICROENTREPRENEUR…

SOCIAL MICROENTREPRENEUR


PASORAPA

If we have the metodologie, we can planify for education, water, health, telecomunications and other basic services.

MAPPING THE MOBILE PHONE SIGNAL




MARCH FOR THE LIGHT


THANK YOU