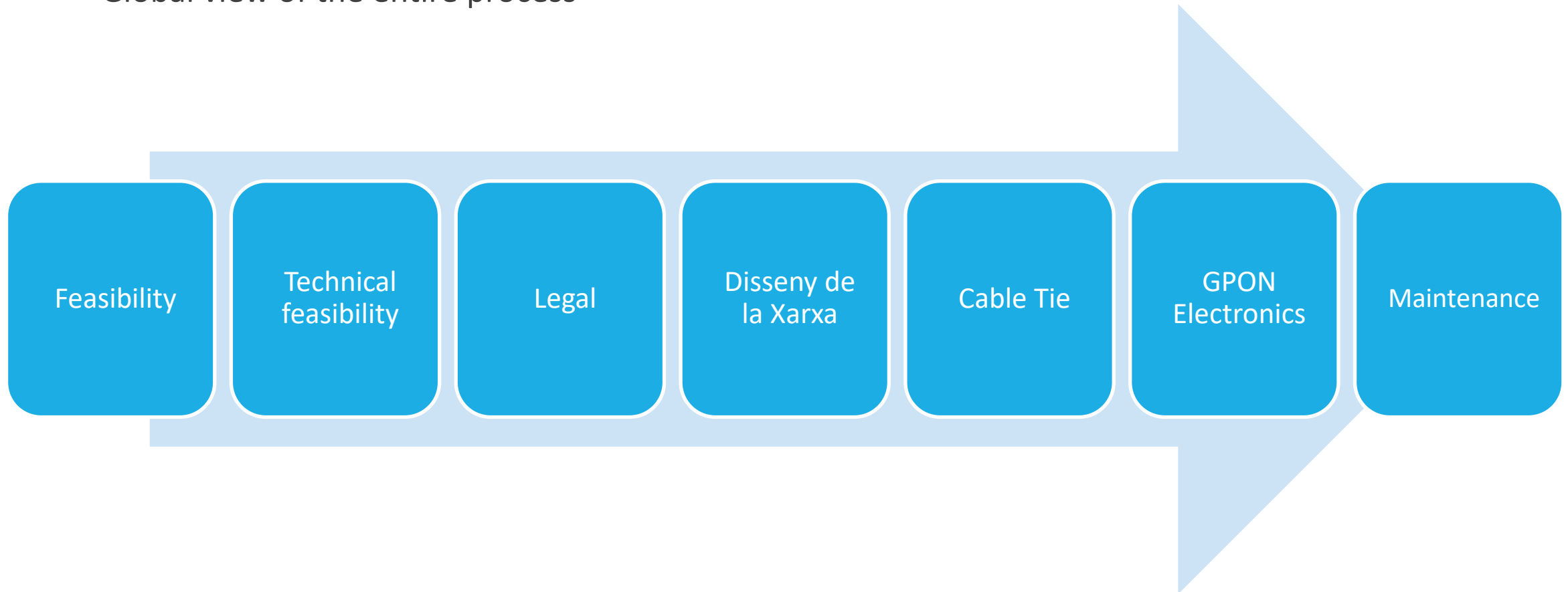


Fiber network deployment paradigms



Objectives of the workshop

Global view of the entire process



1. Feasibility of the Project

First key checklist

- ☐ CAPEX Available. Civil works needed?
- ☐ Transport Availability (OF or Radio)
- ☐ Forecast for OPEX
 - ☐ Cost Transport services
 - ☐ Maintenance Reservation
 - ☐ Reservation Servei (Operator vs Association)
 - ☐ Recurrent infrastructure measurement (MARCo, Towers, Renting)

2. Technical feasibility

Where do we pass the cable?

Front

There is need for permissions from the owners and follow the existing wiring

Everyone request them?



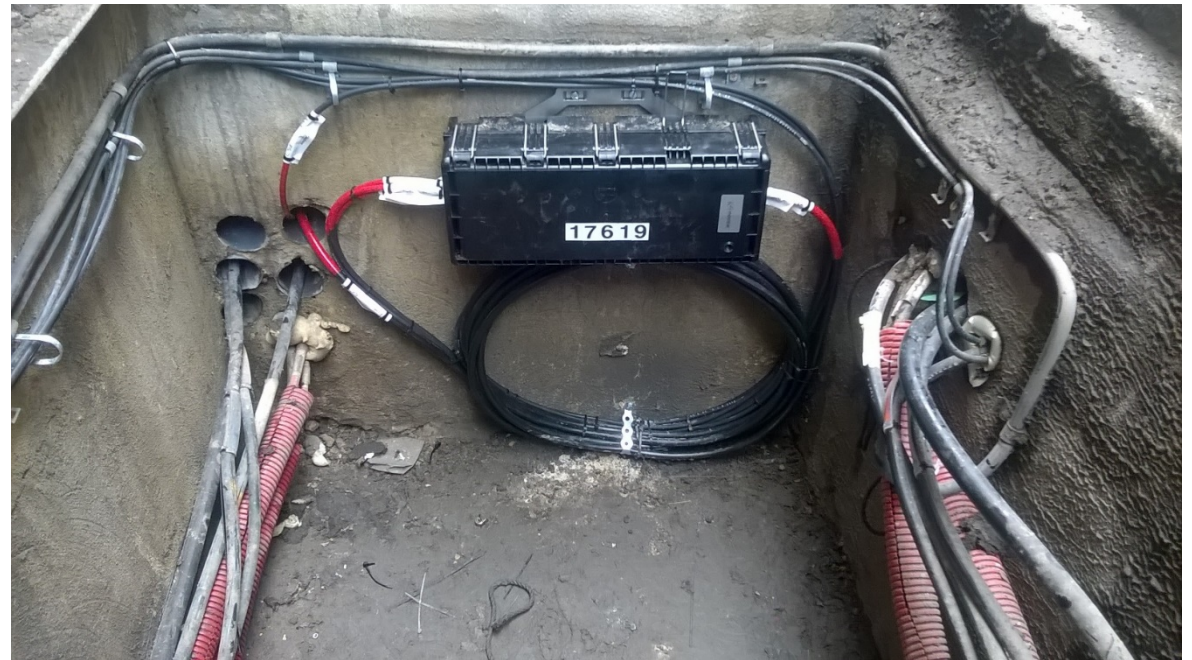
2. Technical feasibility

Where do we pass the cable?

CONDUITS

Is there enough space?

Who is the owner? Permits,
Economic Agreement



2. Technical feasibility

Where do we pass the cable?

POLES

Who is the owner? Permits, Economic Agreement



2. Technical feasibility

Movistar Database



2. Technical feasibility

MARCo - Wholesale Offer of Access to Registers and Ducts

<http://www.movistar.es/operadores/ServiciosRegulados/>

CNMC forces Movistar to place its infrastructures at the disposal of all operators

CNMC Forces Operators to Reach Agreements for Infrastructure Sharing

The agreement is between Owner and interested operator

WHO IS THE OWNER?

Are the poles all from Telefonica? Are all the ducts from Telefonica?

Telefonica says ALL is theirs? How to pay Telefonica the MARCO?

2. Technical feasibility

MARCo - Wholesale Offer of Access to Registers and Ducts

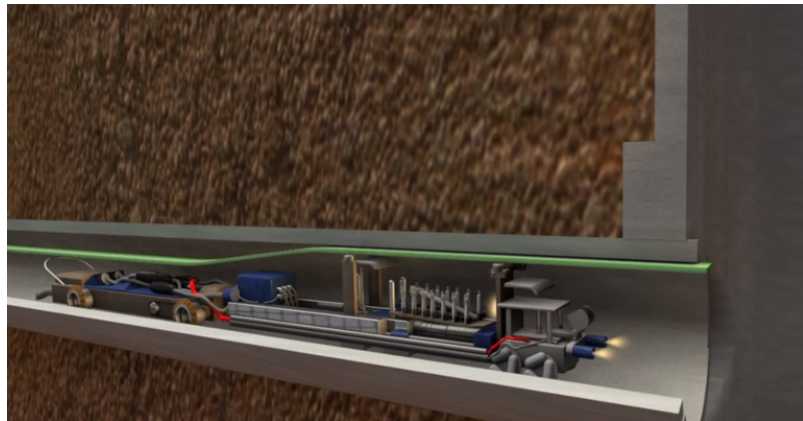
“REPLANNING”



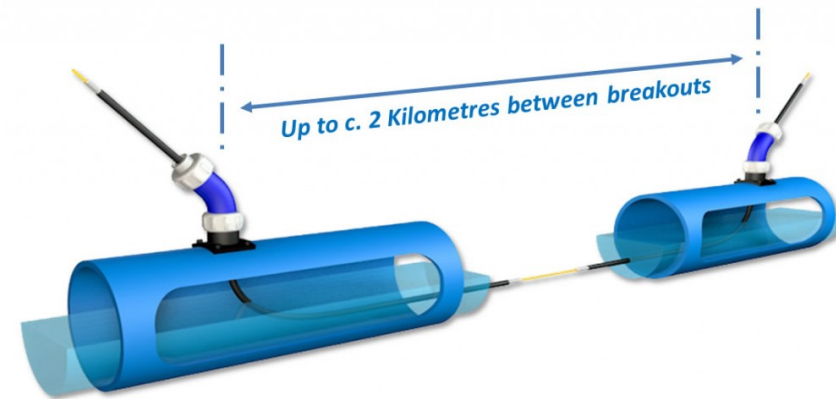
2. Technical feasibility

Other systems

Sewer system



Water pipes (Fiberwater)



And the connections from subscribers? And the maintenance of these infrastructures?

2. Technical feasibility

Location of the data center



Power box

2. Technical feasibility

Viable Project?

Prepare documentation and start

- Pre-project draft
- Project
- Deployment plan
- ...



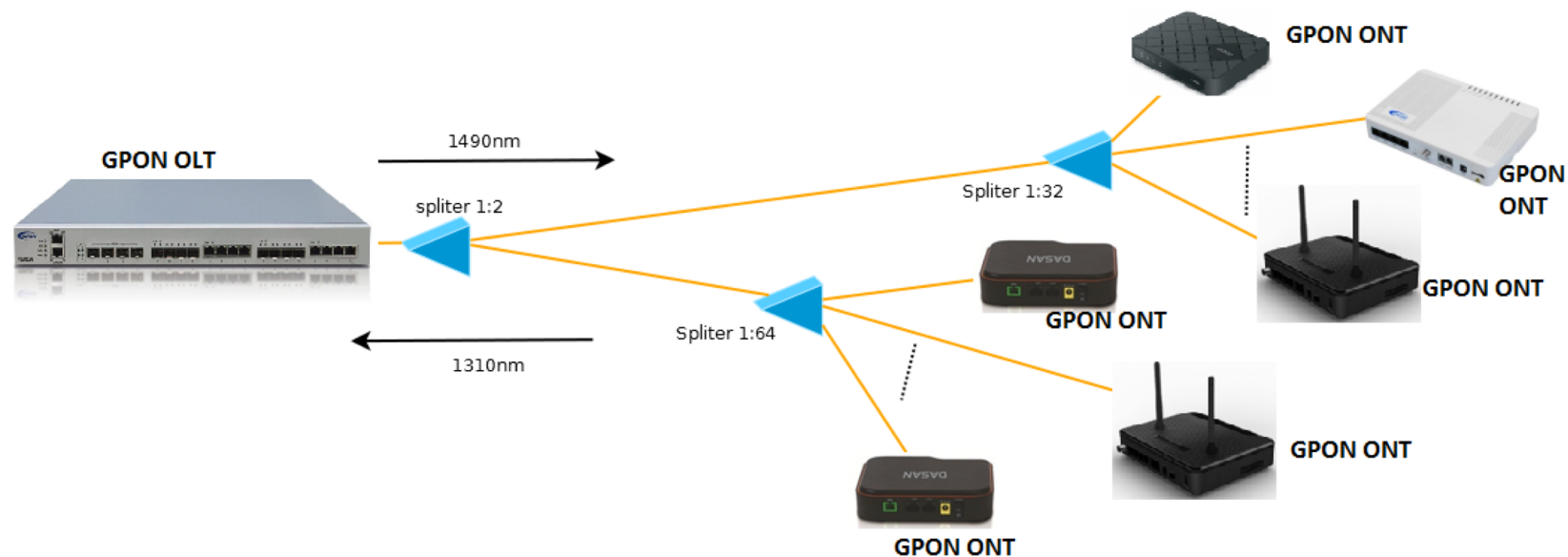
3. Legal aspects

ToDo:

1. Submit "Deployment Plan"
Document to inform what deployments are planned.
Administrative silence → Yes
2. Project for municipality
If required
3. Owners Permissions (including wayleave)
Ajuntament, Generalitat, Diputació, Large Infrastructure operators (Adif, Abertis, etc)
4. MARCo
Managed through Fundació



4. Network design



Objective: To dimension the zones to avoid being short (Buildings, industrial areas, etc)

4. Network design

Calculate the optical power that will reach the client

Power at ONT = Power OLT – loss passive elements

Output power OLT: -1.5dB

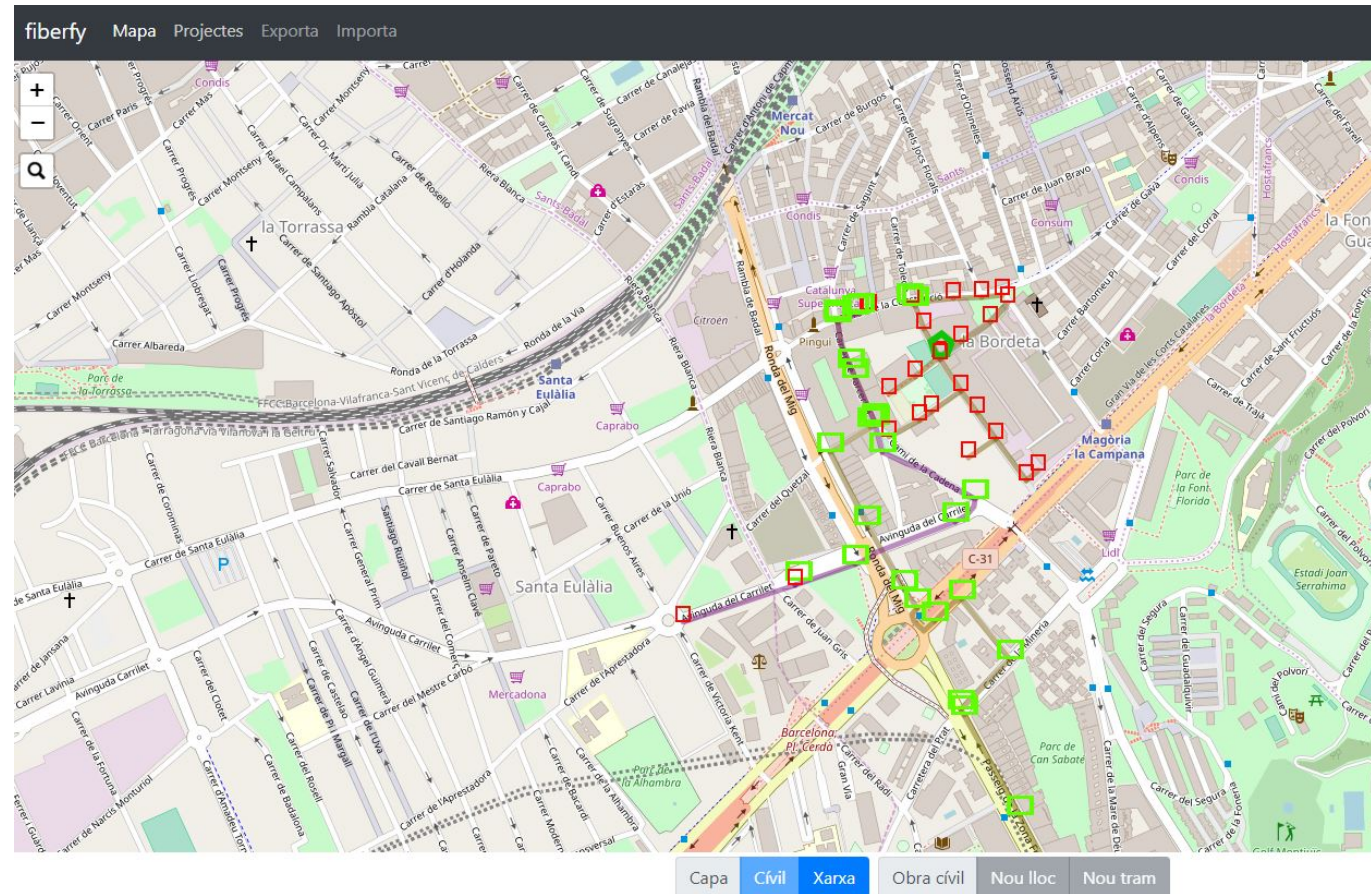
Loss passive elements

Cable	Fussió	Splitter
-0.4dB / km	-0.3dB	1x2 -3dB
		1x4 -6dB
		1x8 -9dB
		1x16 -12dB
		1x32 -15dB
		1x64 -18dB



4. Network design

Fiberfy



5. Cable deployment

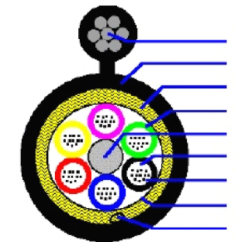
The fiber cable is not expensive → Lets go!

Dimensioning the fibre for

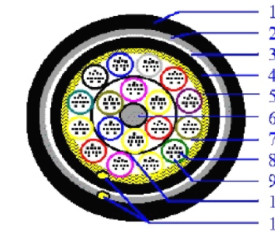
- FTTH Deployment
- Fibres dedicated to subscriber
- Extension of the trunk



Cables de fibra óptica



Cable aéreo (de 12 a 96 hilos):
Cable para exteriores (outdoor), ideal para aplicaciones de CATV. 1. Alambre mensajero, 2. Envoltura de polietileno, 3. Refuerzo, 4. Tubo de protección, 5. Refuerzo central, 6. Gel resistente al agua, 7. Fibras ópticas, 8. Cinta de Mylar, 9. Cordón para romper la envoltura en el proceso de instalación.

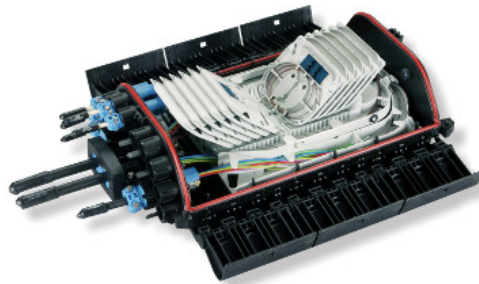


Cable con alta densidad de hilos (de 96 a 256 hilos): Cable outdoor, para troncales de redes de telecomunicaciones. 1. Polietileno, 2. Acero corrugado, 3. Cinta Impermeable, 4. Polietileno, 5. Refuerzo, 6. Refuerzo central, 7. Tubo de protección, 8. Fibras ópticas, 9. Gel resistente al agua, 10. Cinta de Mylar, 11. Cordón para romper la envoltura.

5. Cable deployment

Preconnected system or fused cable ?

	Preconnector	Fused cable
Cost Material	High	Low
Initial cost	Avoids 1 fusion	2 fusions
Security	Prevents manipulation of passive network	Requires CTO manipulation



5. Cable deployment

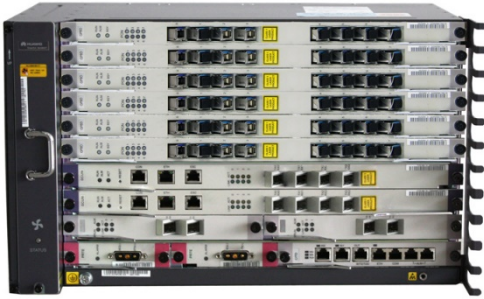
Tools



Fault prevention: loops



6. GPON Electronics



3072 subscribers



512 subscribers



ONT + External Router

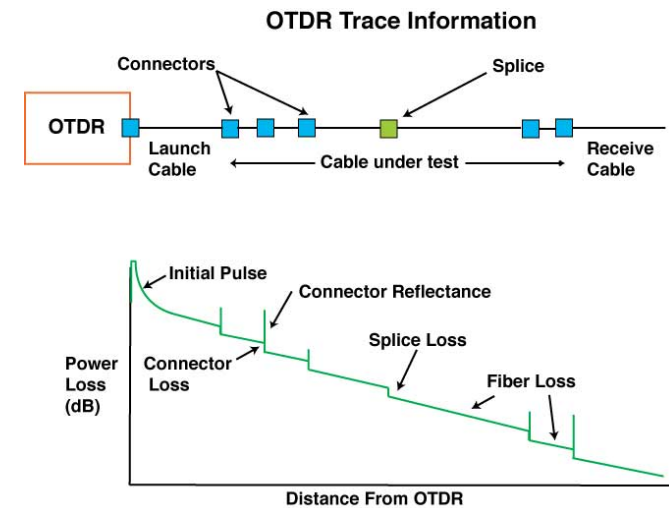


7. Maintenance

Optic fiber → Few faults

80% incidents are problems in households

- Self-provisioning tools : pending topic
- Optical reflectometer (OTDR)



Thanks !

