

ARBOREA

THE ITALIAN DAIRY COMPANY
— SINCE 1956 —

PROJECT FOR THE CREATION OF A BIOMETHANE
PRODUCTION PLANT FOR AUTOTRATATION



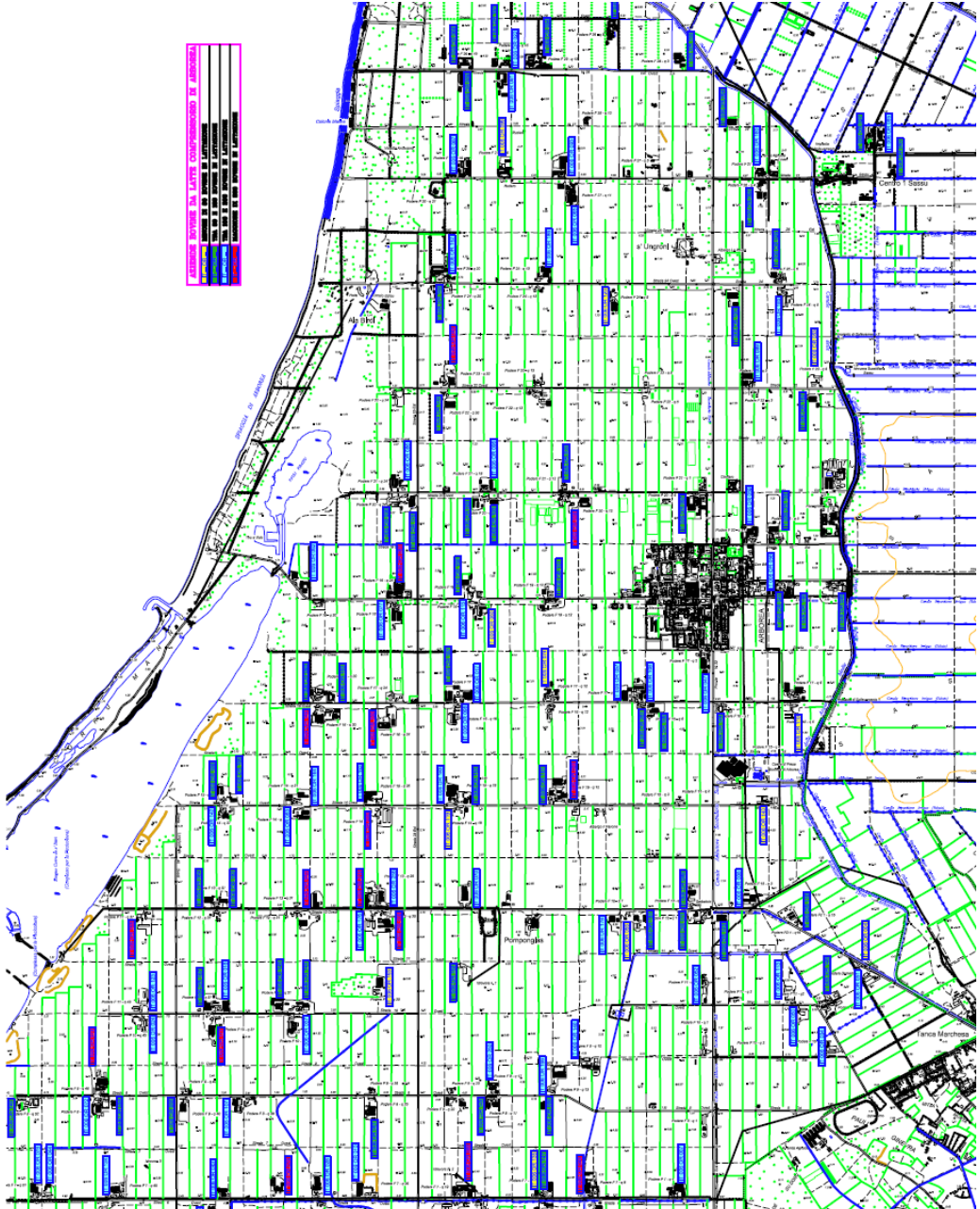
STUDIO CORRAO

— Ingegneria & ambiente —

1 - specific objectives foreseen by the project

- 1) Enhance the potential of the sewage produced by the Cooperative's member companies through the production of biomethane, in order to take advantage of the current incentives provided by current Italian legislation (Ministerial Decree of 2 March 2018);
- 2) Generate a virtuous circular economy thanks to the possibility of using Biomethane as fuel in the vehicles of the company fleet;
- 3) Reduce the level of CO2 emissions

2 -FARMER COMPANIES BASED IN ARBOREA'S TERRITORY



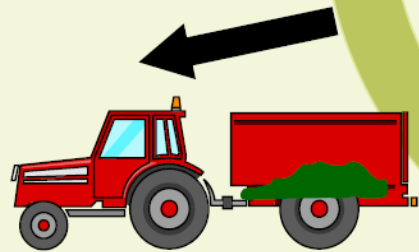
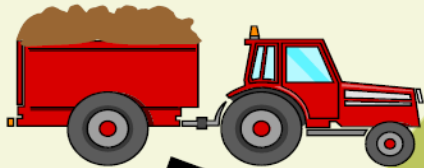
ELENCO STALLE	
IT 006 CR 146	BERGO GIANNI
IT 006 CR 062	BISSINO GIOVANNI
IT 006 CR 064	BUCALATI TIBBIO
IT 006 CR 063	ALZI SABIANA GIOIA
IT 006 CR 061	ARCAI ANTONIO
IT 006 CR 064	ARCAI CARMELO
IT 006 CR 066	ARCAI PASQUALE
IT 006 CR 067	ARZUFFI GUSTINO INSETO RENZO
IT 006 CR 046	AZ. AGR. COSTA MARIANO MARCO
IT 006 CR 067	AZ. AGR. DE VECCHI
IT 006 CR 134	AZ. AGR. F.L.L. POLICICCHI
IT 006 CR 041	AZ. AGR. MOROSOGGIOLI PAOLI
IT 006 CR 187	AZ. AGR. PANETTO BERGO ALDO GIORGIO
IT 006 CR 148	AZ. AGR. ROSSI IVOFELLI
IT 006 CR 141	AZ. AGR. GALLI S.F. LU. SOTTAU
IT 006 CR 068	BALLIARI MARCO ROBERTO
IT 006 CR 010	BELLUCCI ANTONIO
IT 006 CR 011	BELTRAME LIBIO
IT 006 CR 012	BELTRAME LUCIANO GIOVANNI
IT 006 CR 013	BELTRAME ANTONIO RENATO
IT 006 CR 014	BENVENUTI SERGIO RENATO
IT 006 CR 016	BORGASIN EDLA BONDI F.L.L.
IT 006 CR 017	BORGASIN GIOVANNI
IT 006 CR 018	BORGASIN MARCO ROBERTO A. S.
IT 006 CR 020	BORTOLO LUC. GIANNI PAOLINO
IT 006 CR 021	BO GAR PIERO
IT 006 CR 022	BONICCHI GIORDO LUCIANO
IT 006 CR 004	BORGATO ANGELO
IT 006 CR 023	BOSCATO DOMENICO
IT 006 CR 025	BOSCHETTO ANTONIO + GIORGIO
IT 006 CR 024	BOSCHETTO ELIO MARCO
IT 006 CR 026	BOSCHI ROBERTO E CESARINO
IT 006 CR 028	BRANDINI ANTONIO GIOVANNI
IT 006 CR 028	CADONI ANTONIO FRANCESCO
IT 006 CR 005	CAPPALARO BRILLO E ANTONIO
IT 006 CR 005	CAPPALARO VITTORIO SERGIO A.
IT 006 CR 020	CAPPARRO F.L.L.
IT 006 CR 028	CAPPARRO GIANNI + ROSARIA
IT 006 CR 032	CARRA NICOLA + OMBRO
IT 006 CR 033	CARRA PASQUALE-ALVATORE
IT 006 CR 034	CASADE FABO + S. EFANO
IT 006 CR 036	CASCHETTO ROBERTO
IT 006 CR 037	CASSELLATA BARRI
IT 006 CR 038	CASSELLATA ALBERTO BRUNO + PAOLO
IT 006 CR 039	CASSELLATA ANTONIO
IT 006 CR 041	CHIGIONI GINO + FRANCESCO
IT 006 CR 046	CHIGIONI L.L. AZ. AGR.
IT 006 CR 043	CHIGIONI MARCONI
IT 006 CR 043	CIO. AGR. BIANCHI BRUNO + ROBERTO
IT 006 CR 043	CIO. L. ANDRINO + TETTO MOBILI
IT 006 CR 044	CIO. SALVATORE
IT 006 CR 047	CIOSTELLA GIORDO
IT 006 CR 048	CIOSTELLA LINO PIERO FELICE
IT 047 CR 041	COTTA FRANCESCO
IT 006 CR 049	CROCIETTO ALDO GUARINONDI
IT 006 CR 048	CROCIETTO ANTONIO EMANUELE
IT 006 CR 180	CROCIETTO F.L.L. (S.F. L'AVV.)
IT 006 CR 051	CROCIETTO LINO GIANNI A. S.F.
IT 006 CR 046	DE VECCHI FRANCO EDLA NORD
IT 006 CR 042	DE VECCHI GIOVANNI PIERO
IT 006 CR 043	DE VECCHI M. GIUSEPPE
IT 006 CR 250	DEICHO NICOLA REED + ROBERTO
IT 006 CR 044	DESI FRANCO A. M. A. S.
IT 006 CR 045	DESI TORO EMANUELE
IT 006 CR 058	DE VECCHI GIOVANNI PIERO
IT 006 CR 049	DE VECCHI M. GIUSEPPE
IT 006 CR 040	DIAMANTI ANGELO
IT 006 CR 042	DIAMANTI AGOSTINO
IT 006 CR 043	DIAMANTI BLO. + ZARBONINO
IT 006 CR 044	DIAMANTI SERGIO
IT 006 CR 045	DILLAZZO AGRARIO GIORDO
IT 006 CR 047	DILLAZZO TORO
IT 006 CR 046	DILLAZZO VINCENZO
IT 006 CR 046	DILLAZZO ENZO + RENATO
IT 006 CR 046	DOBBO MARCO ROBERTO ALDO
IT 006 CR 047	DOLFINO PIERO
IT 006 CR 040	DON LUIGIANO RENATO
IT 006 CR 043	DON LUIGIANO
IT 006 CR 042	LADI GIOVANNI PIERO NINO

3 – EXPLANATORY FLOW CHART OF THE EXPECTED CIRCLE

PARTE AGRICOLA

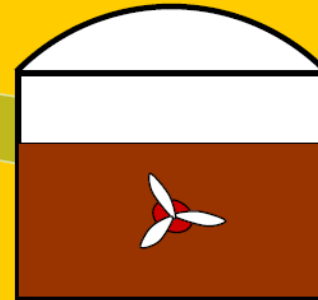
PARTE GESTIONALE

Trasporto reflui



Spandimento

Produzione biogas



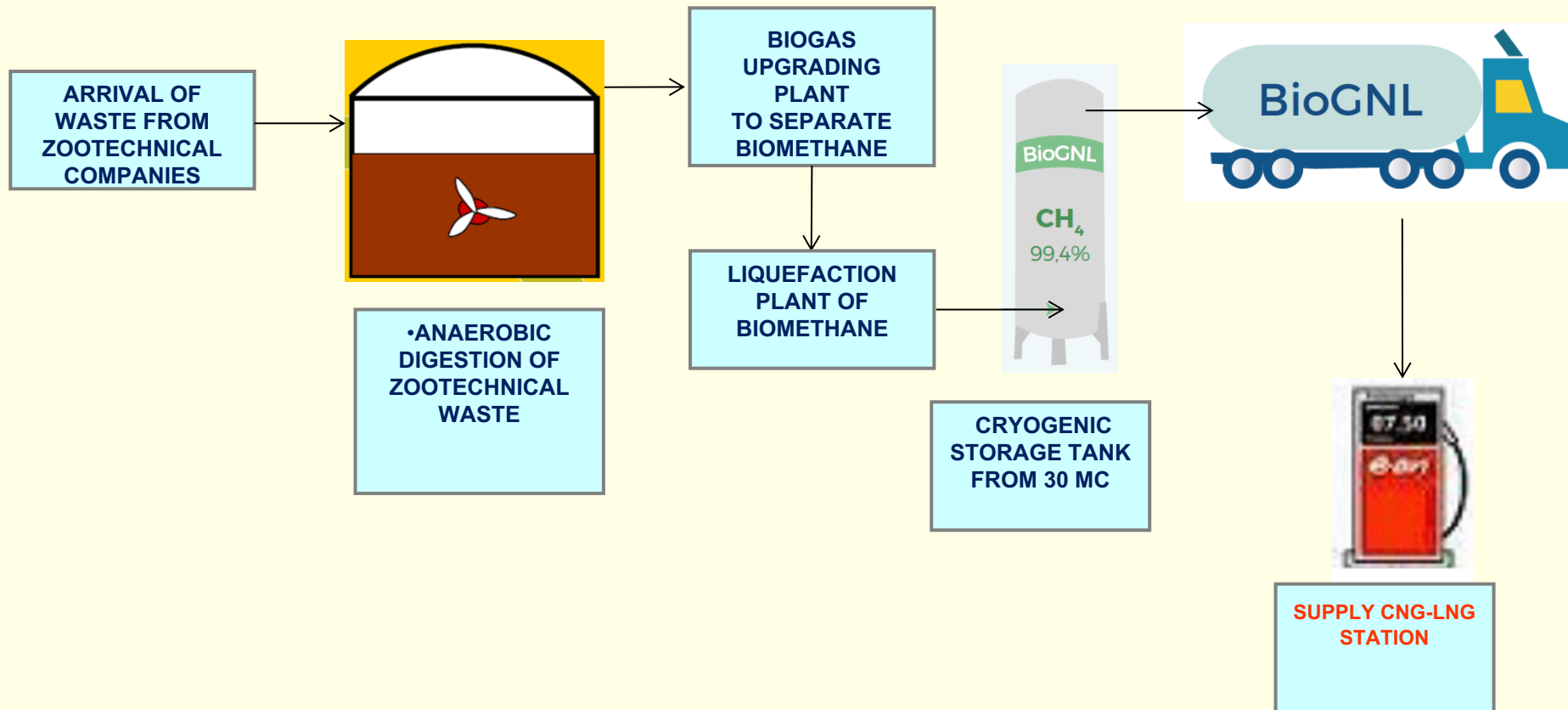
Vendita biometano

Trattamento digestato (Compostaggio)

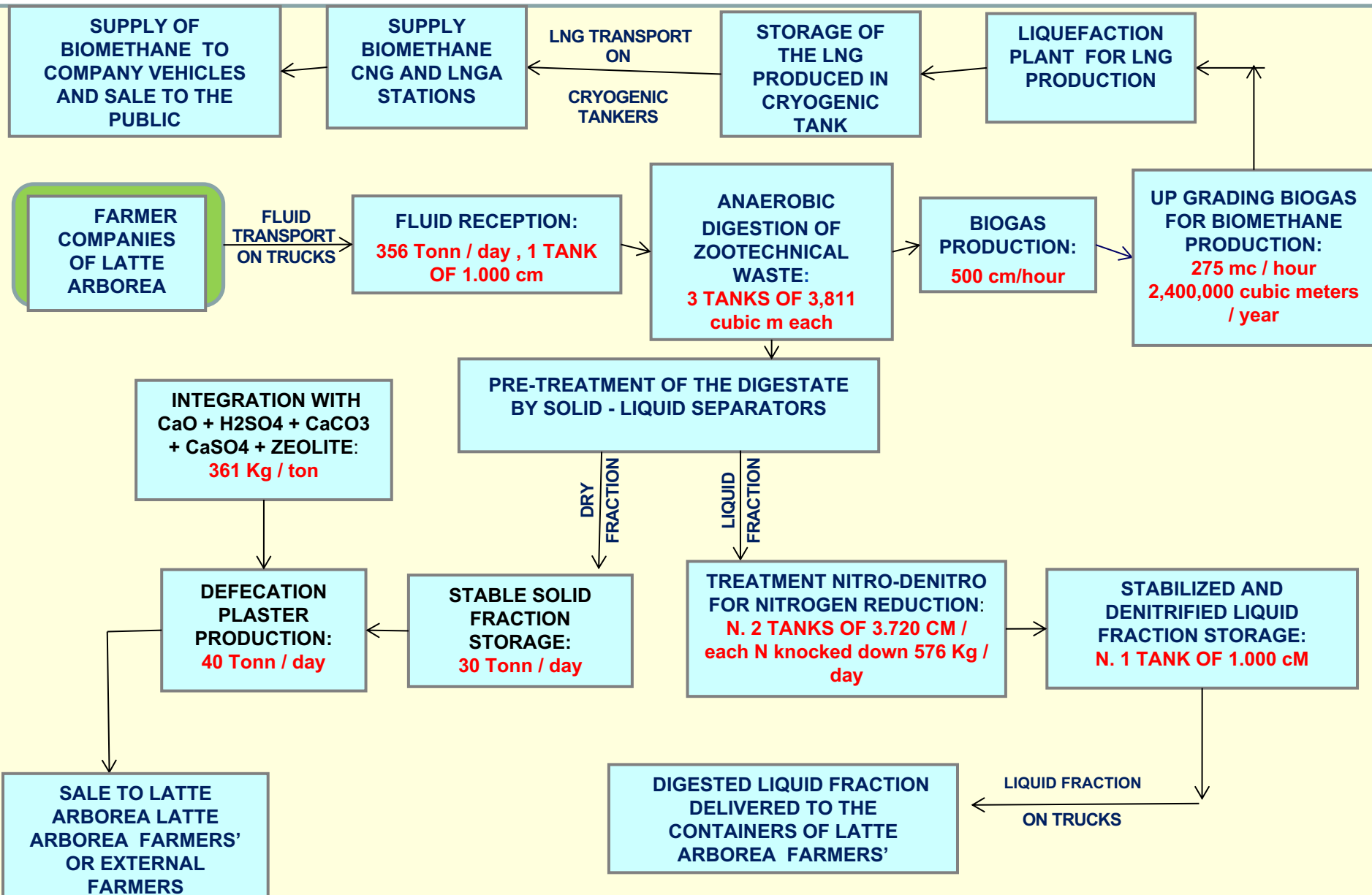


Vendita concime
Gesso di defecazione

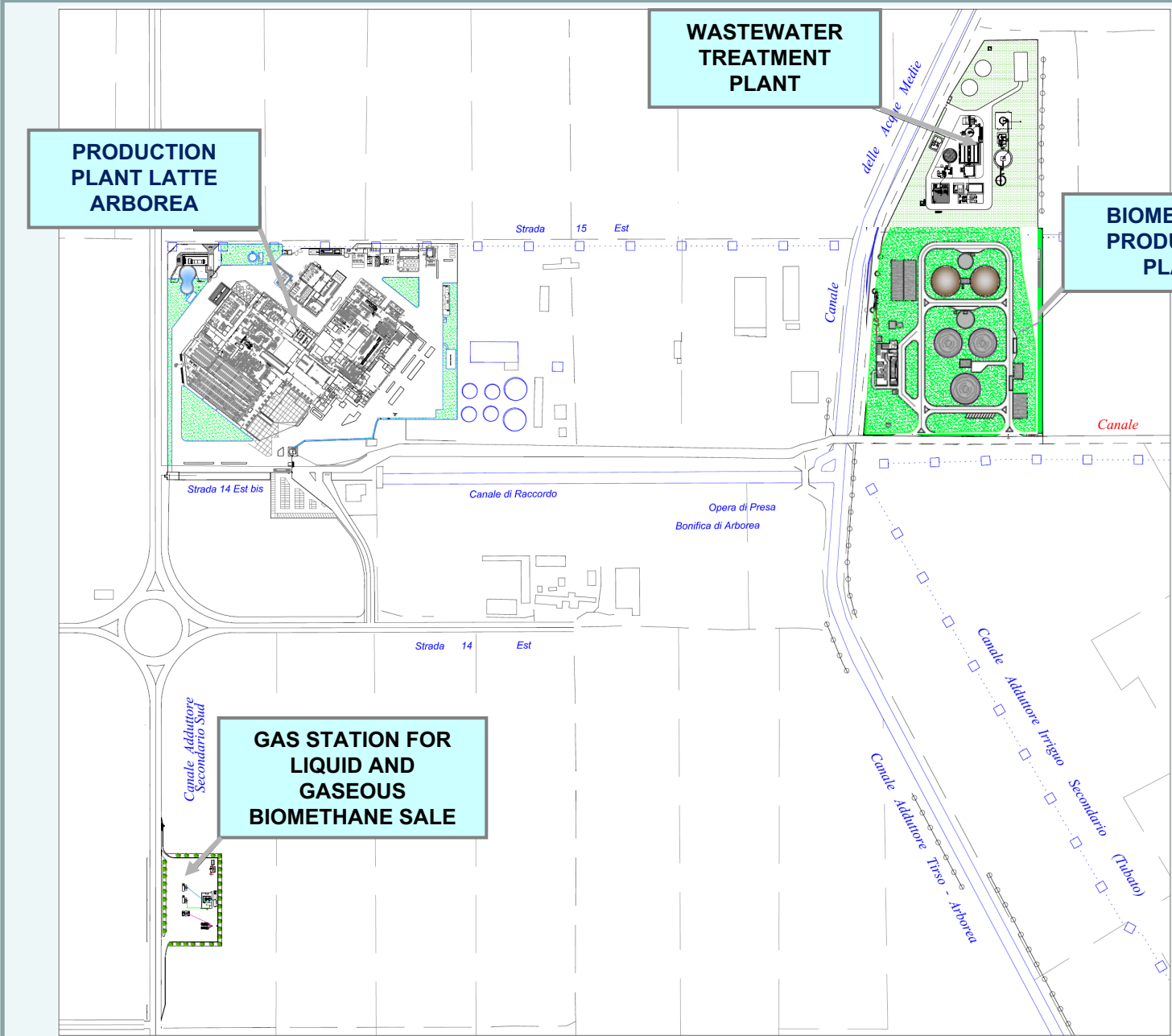
4 – EXPLANATORY FLOW CHART: BIOMETHANE CYCLE



5 - EXPLANATORY FLOW CHART: PRODUCTION CYCLE



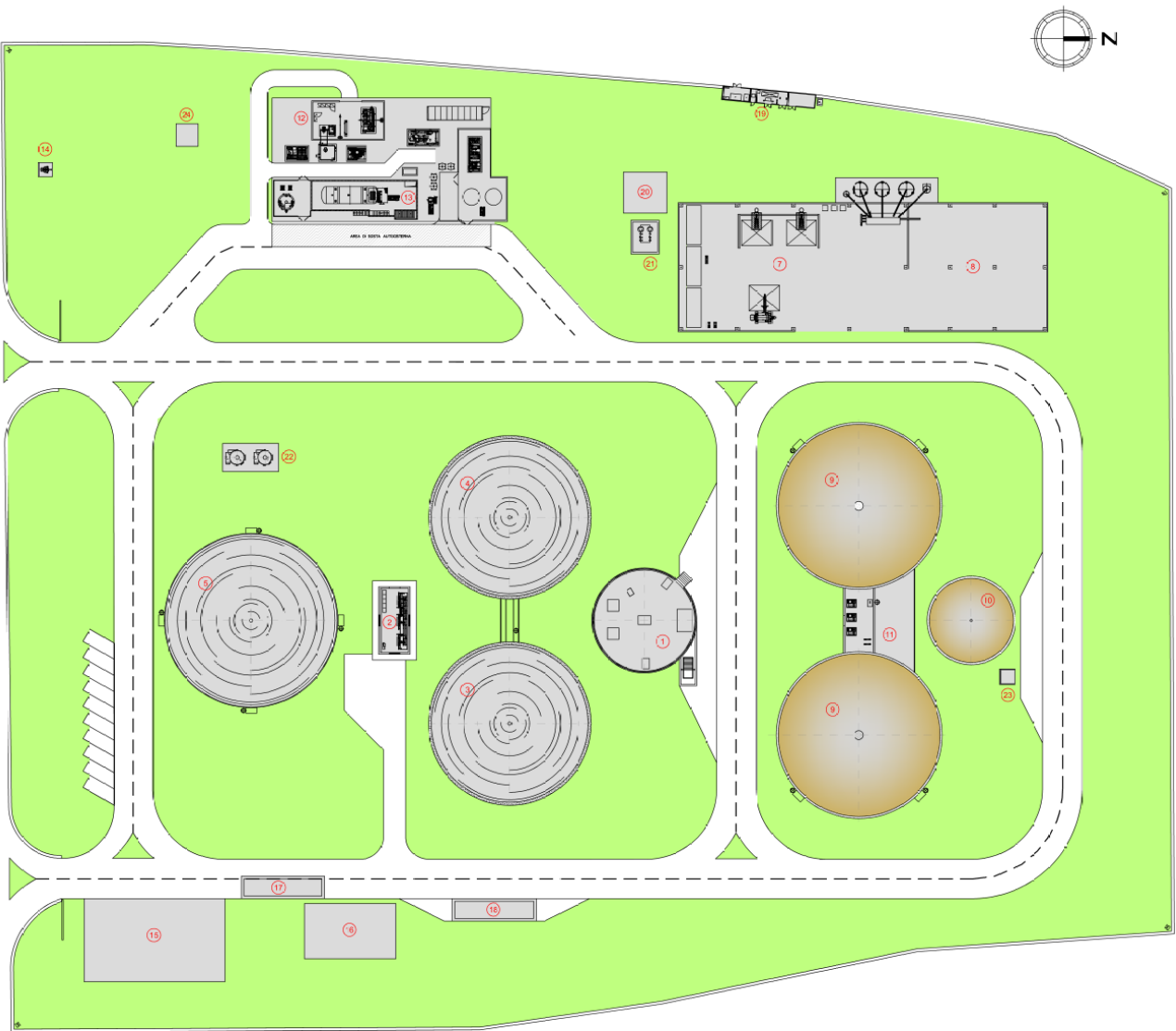
6.1 – THE PROJECT: INVESTEMENTS IN ARBOREA SITE



6.2 – THE PROJECT: RENDERING OF BIOMETHANE PRODUCTION PLANT



6.3 – THE PROJECT: PLANIMETRY OF BIOMETHANE PRODUCTION PLANT



Legenda

- 1 VASCA INGRESSO LIQUAMI
- 2 LOCALE POMPE
- 3 DIGESTOR 1
- 4 DIGESTOR 2
- 5 DIGESTOR 3
- 6 FILTURA ESPANSIONE
- 7 SEPARATORE SOLIDO-LIQUIDO
- 8 TRATTAMENTO SEPARATO SOLIDO
- 9 VASCA NITRO-DENTRO DIGESTATO LIQUIDO
- 10 VASCA PRELIEVO DIGESTATO P/SR FERTIRRIGAZIONE
- 11 LOCALE COMPRESSORI
- 12 UPGRADING BIOGAS E LIQUEFAZIONE
- 13 SERBATOIO DI STACCOGGIO CROGENICO LIQ
- 14 TORCIA
- 15 PARCHEGGIO COPERTO MEZZIMAGAZZINO
- 16 FABBRICATO UFFICI E LOCALI TECNICI
- 17 PESA
- 18 LAVABUOTE
- 19 CABINA ELETTRICA
- 20 RISERVA IDRICA
- 21 LOCALE POMPE
- 22 IMPIANTO DI DESOLFORAZIONE
- 23 POZZETTO PRELIEVO AUTOBOTTE
- 24 GUARDIA IBRAULICA

NO.	PROIEZIONE	ABBINATA	SE	DATA	SCALE	APP.
3	PROIEZIONE		SE <td>2018</td> <td>A3</td> <td>R. A. D.</td>	2018	A3	R. A. D.

ARBOREA Assegnatari Associati Arborea
Società Cooperativa Agricola p.a.

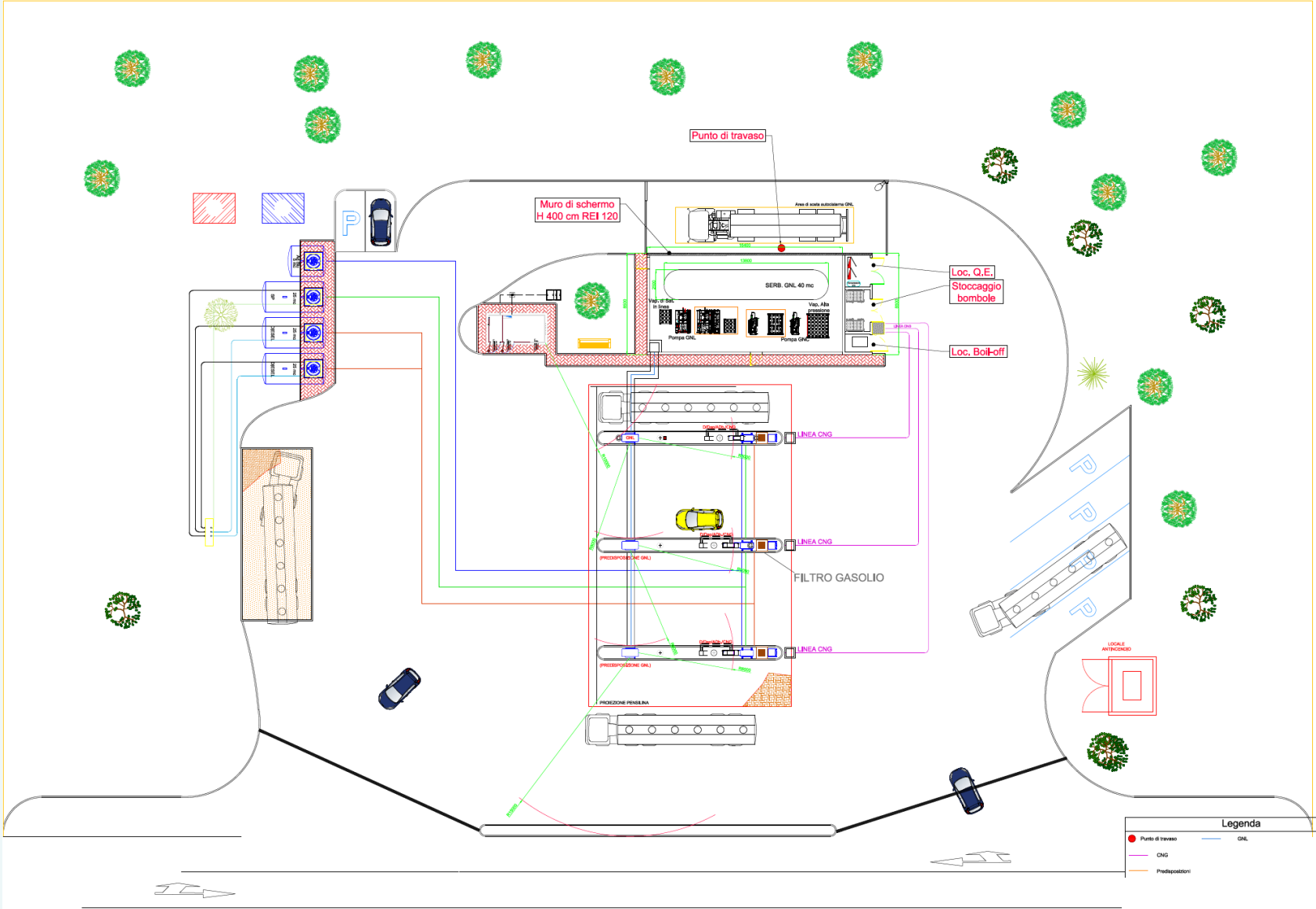
PROGETTO DEI LAVORI DI REALIZZAZIONE DI UN IMPIANTO INTEGRATO PER LA GESTIONE DEGLI EFFLUENTI ZOOTECNICI DEL TERRITORIO DI ARBOREA FINALIZZATO ALLA PRODUZIONE DI BIOMETANO PER AUTOTRAZIONE ED ALLA RIDUZIONE DELLE ECCEZENDE AZOTATE

- PROGETTO DEFINITIVO -

Numero: 3
Piantina: PLANIMETRIA GENERALE
Scala: 1:200
Data: 15/09/2018
Autore: ARBOREA

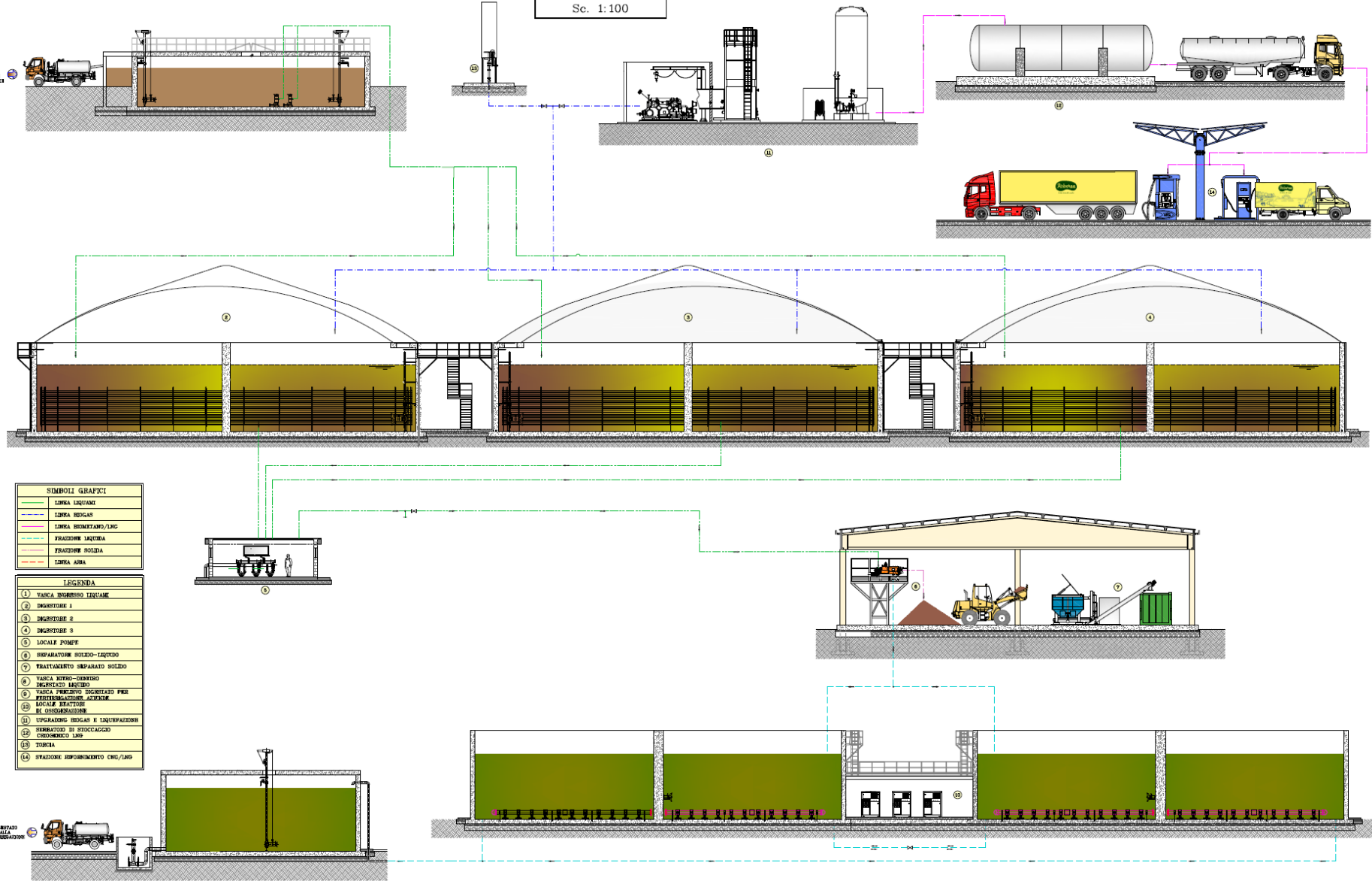
PRODOTTORE: STUDIO COBRAO
PRODOTTORE: ARBOREA
PRODOTTORE: ARBOREA

6.4 – THE PROJECT: LAYOUT OF THE GAS STATION FOR BIOMETHANE SALE



6.5 – THE PROJECT: FLOW CHART OF BIOMETHANE PRODUCTION AND USE OF IT

SCHEMA DI FLUSSO
Sc. 1:100



SIMBOLI GRAFICI

- IMBIA INQUAMI
- IMBIA SECCHE
- IMBIA SOTTILE/NUO
- FRAZIONE LIQUIDA
- FRAZIONE SOLIDA
- IMBIA ARIA

LEGENDA

- ① VASCA INGRESSO INQUAMI
- ② DIGESTORE 1
- ③ DIGESTORE 2
- ④ DIGESTORE 3
- ⑤ LOCALI POMPE
- ⑥ SEPARATORE SOLIDO-LIQUIDO
- ⑦ TRATTAMENTO SEPARATO SOLIDO
- ⑧ VASCA RETRO-DIGESTIONE SEMPLICE
- ⑨ VASCA PRODOTTO DIGESTATO PER FERTILIZZAZIONE AGRICOLA
- ⑩ LOCALI TRATTATE
- ⑪ DE OSSIDAZIONE
- ⑫ SEPARAZIONE SECCHE E INDEFFAZIONE
- ⑬ FERRAZIONE DI SOTTACQUE
- ⑭ CILINDRO LNG
- ⑮ TORCIA
- ⑯ STAZIONE RIFORNIMENTO CNG/LNG

GRUPPO ARBOREA

7.1 – FINANCIAL INDICATORS: CAPEX, OPEX, REVENUES



Here in please find descolused an estimate of the three indicators :

- Cost of the invesment, (**CAPEX**)
- Annual operating cost for production and maintenance (**OPEX**)
- Sales Revenues and related Governmental Subsidies – CIC (**REVENUES**)

These items have been hypothesized for the realization of the entire project, specifying that the evaluation must be intended as purely indicative and not binding.

Participants invited to the selection procedure will have the obligation to analyze in detail all the assessments relating to the quantification of the costs of carrying out all the planned investments, assuming full responsibility for them.

7.2 – FINANCIAL INDICATORS: CAPEX

CAPEX:

<u>SUMMARY OF THE COST OF THE INVESTMENT</u>	EURO
CONSTRUCTION COSTS OF THE BIOGAS PRODUCTION PLANT AND NITROGEN REMOVAL	€ 6.000.000
CONSTRUCTION COSTS OF THE UP - GRADING AND BIOMETHANE LIQUEFACTION PLANT	€ 3.300.000
CONSTRUCTION COSTS OF THE GAS STATION TO SELL BIOMETHANE IN ARBOREA	€ 1.200.000
OVERHEADS AND MISCELLANEOUS EXPENSES (4,76%)	€ 500.000
TOTAL CAPEX	€ 11.000.000

7.3 – FINANCIAL INDICATORS: OPEX

The estimate of the operating and maintenance operating costs that were assumed for the operation of the plants is summarized below, valued for the entire period of 20 years assuming to benefit the **CIC** incentive, (as reported in the REVENUE paragraph), pursuant to Ministerial Decree of 2 March 2018, specifying that the evaluation must be intended as purely indicative and not binding.

Participants invited to the selection procedure will have the obligation to analyze in detail all the assessments concerning the quantification of the operating and maintenance costs of all the investments envisaged, including any plant adjustments necessary over time to ensure maximum system functionality in the as a whole, taking full responsibility for it.

It should be noted that the costs of transporting the waste were not considered as compensated by the contribution of the shareholders.

<u>SUMMARY OF OPERATING AND MAINTENANCE COSTS PER YEAR</u>	EURO
AVERAGE ANNUAL ELECTRICAL COSTS, CONSUMPTION, CONSUMABLE MATERIALS AND MAINTENANCE CHARGES	€ 1.255.000
- AVERAGE ANNUAL PERSONNEL COSTS	€ 190.000
AVERAGE ANNUAL INSURANCES AND MISCELLANEOUS COSTS	€ 100.000
TOTAL AVERAGE ANNUAL OPEX	€ 1.545.000

The revenues obtainable following the commissioning of the plant are summarized below, specifying that the assessment must be intended as purely indicative and not binding.

Participants invited to the selection procedure will have the obligation to analyze in detail all the assessments concerning the quantification of the actual revenues obtainable thanks to the production of Biomethane, for the entire duration of the 20 years provided for by the incentive system, assuming full responsibility for it.

It should be noted that as regards the enhancement of the CICs, a value of € 375 for the first 10 years and a value of € 350 for the remaining 10 years was taken as a precaution, while for the sale of Biomethane a precautionary value of € 0.60 per kg.

CIC: “**C**ertificate di **I**mmissione in **C**onsumo”, are the Certificates of release for the consumption of biomethane produced as per the Italian biomethane decree which provides GSE for the withdrawal of such Certificates.

GSE: “**G**estore dei **S**ervizi **E**nergetici” – is a limited company that plays a central role in the promotion, support and development of renewable energy sources in Italy. GSE’s sole shareholder is the Italian Ministry of Economy and Finance which, in consultation with the Ministry of Economic Development, provides guidance on GSE’s activities.

7.4 – FINANCIAL INDICATORS: REVENUES

Details of estimated annual revenues:

<u>REVENUES</u>	EURO
- AVERAGE ANNUAL SALES OF CIC WHICH IS LINKED TO THE SALE OF BIOMETHANE	€ 1.600.000
- AVERAGE ANNUAL SALE OF BIOMETHAN	€ 900.000
AVERAGE ANNUAL TOTAL REVENUES	€ 2.500.000

7.5 – FINANCIAL INDICATORS: COSTS & BENEFITS

On the basis of the Capex and Opex assumed, and taking into account the achievable revenues, a cost benefit analysis was carried out.

The development of the project over a period of twenty (20) years highlights the full financial sustainability of the investment, with a good margin, expected at 500,000 euros per year.

It is also specified in this case that their evaluation must be intended as purely indicative and not binding, as the participants invited to the procedure must carry out the cost-benefit analysis based on the values that will be determined by them.