SIMPACTRANS

Exploration sommaire du modèle

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LA COMPLEXITÉ

- Un modèle de Dynamique des systèmes est par construction complexe.
- Il est donc difficile de le montrer dans le détail
- Mais il est possible de l'explorer par bloc....
- ... et de l'utiliser pour illustrer son fonctionnement

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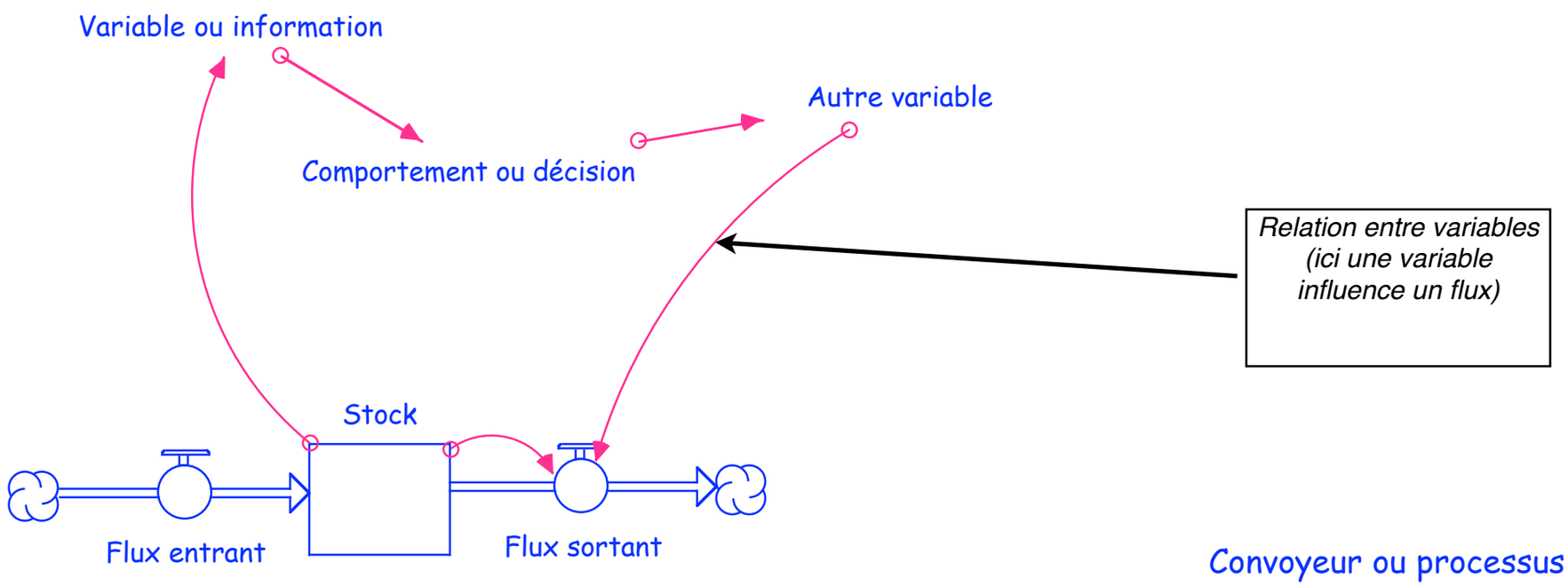
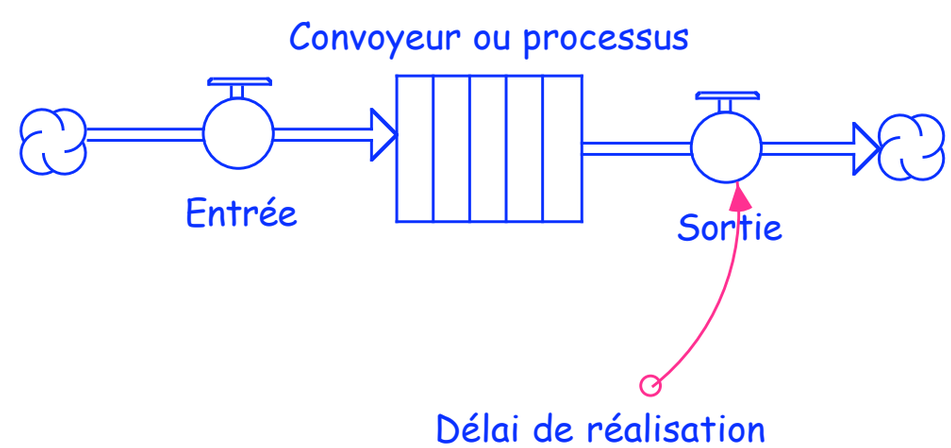
“Légende” des diagrammes





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Equations correspondant au diagramme ci dessus (les relations ne sont pas spécifiées)

Convoyeur_ou_processus(t) = Convoyeur_ou_processus(t - dt) + (Entrée - Sortie) * dt

INIT Convoyeur_ou_processus = { Place initial value here... }

TRANSIT TIME = 1

INFLOW LIMIT = ∞

CAPACITY = ∞

INFLOWS:

Entrée = *{ Place right hand side of equation here... }*

OUTFLOWS:

Sortie = CONVEYOR OUTFLOW

Stock(t) = Stock(t - dt) + (Flux_entrant - Flux_sortant) * dt

INIT Stock = { Place initial value here... }

INFLOWS:

Flux_entrant = { Place right hand side of equation here... }

OUTFLOWS:

Flux_sortant = { Place right hand side of equation here... }

Autre_variable = { Place right hand side of equation here... }

Comportement_ou_décision = { Place right hand side of equation here... }

Délai_de_réalisation = { Place right hand side of equation here... }

Variable_ou_information = { Place right hand side of equation here... }

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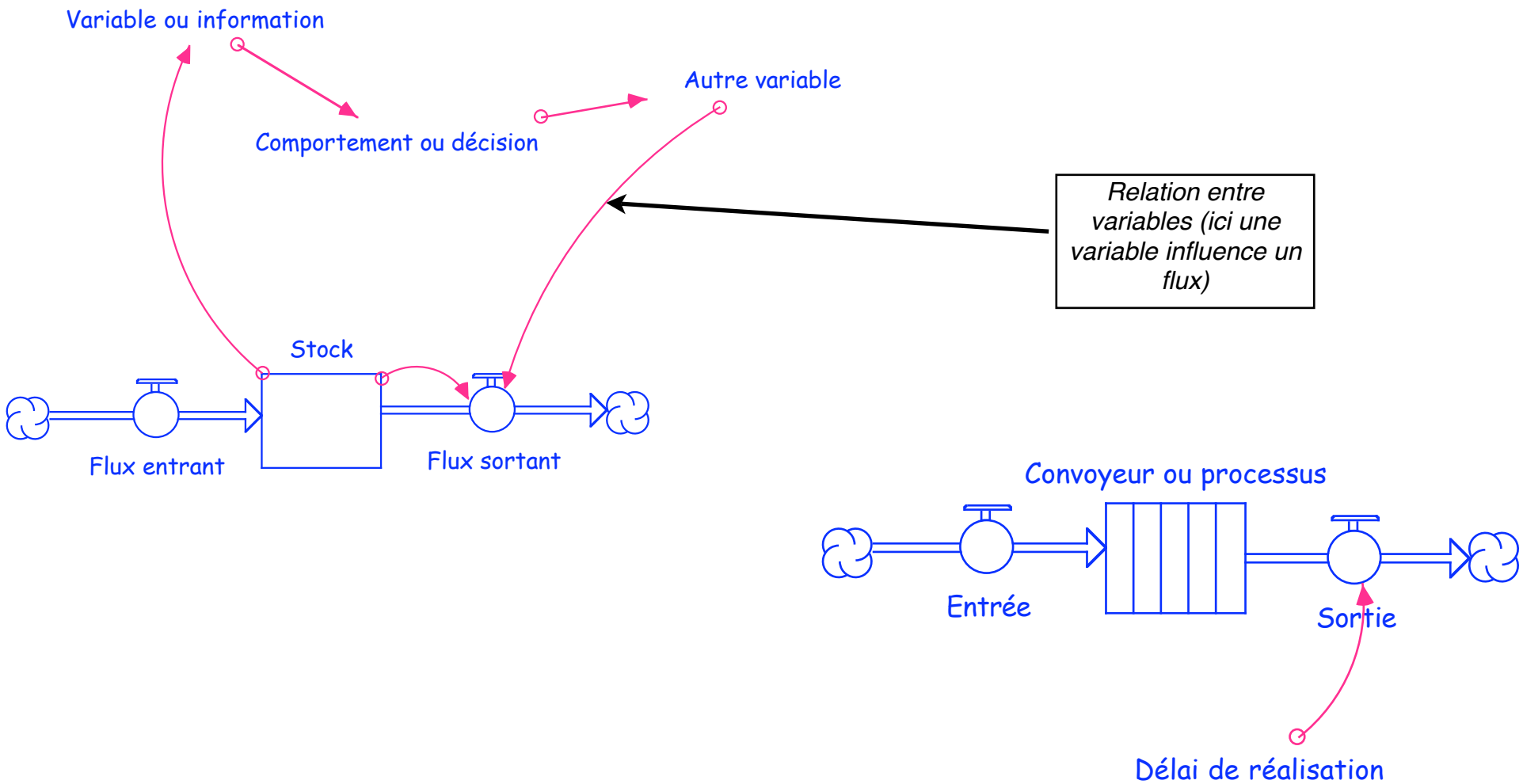

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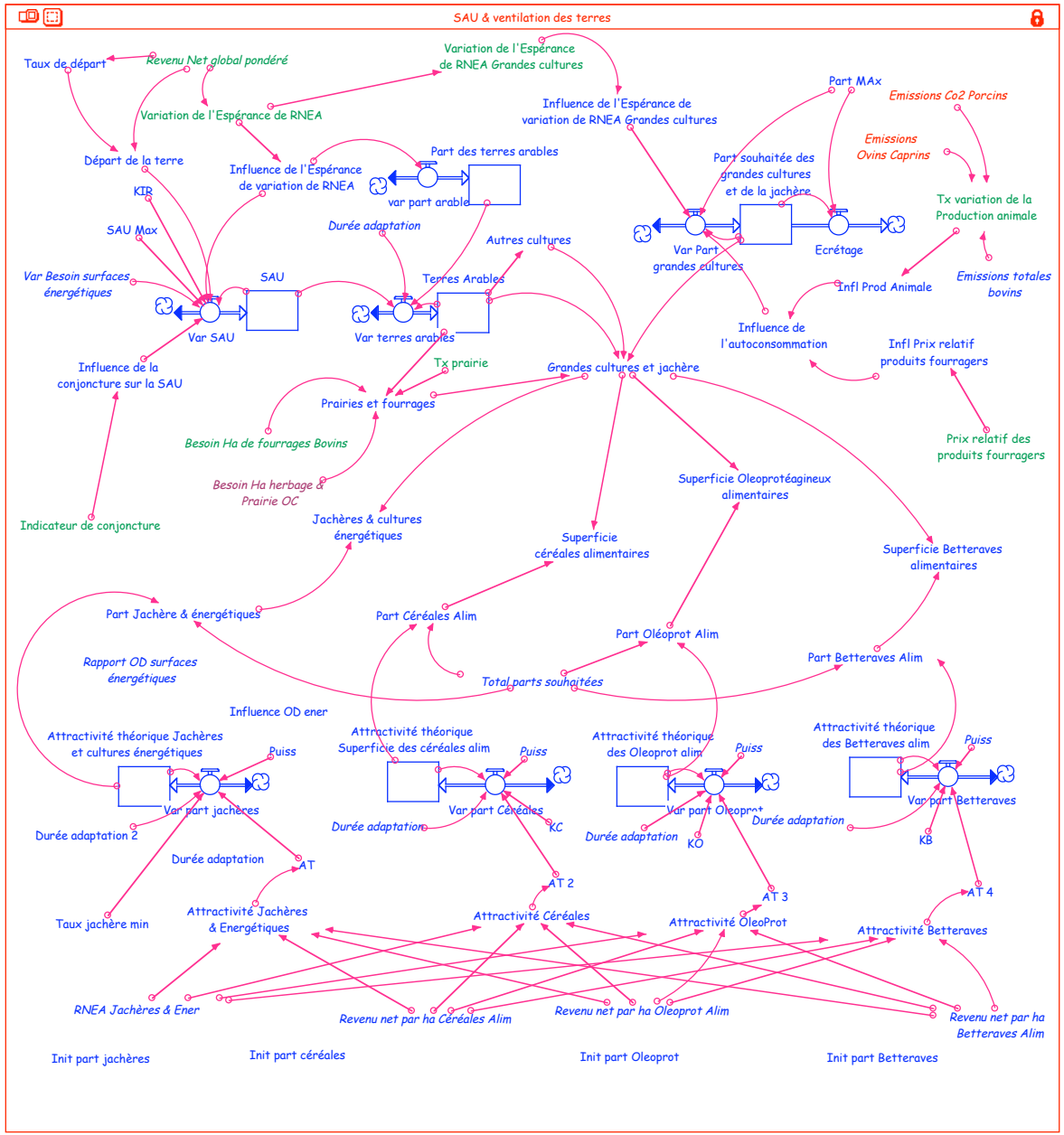
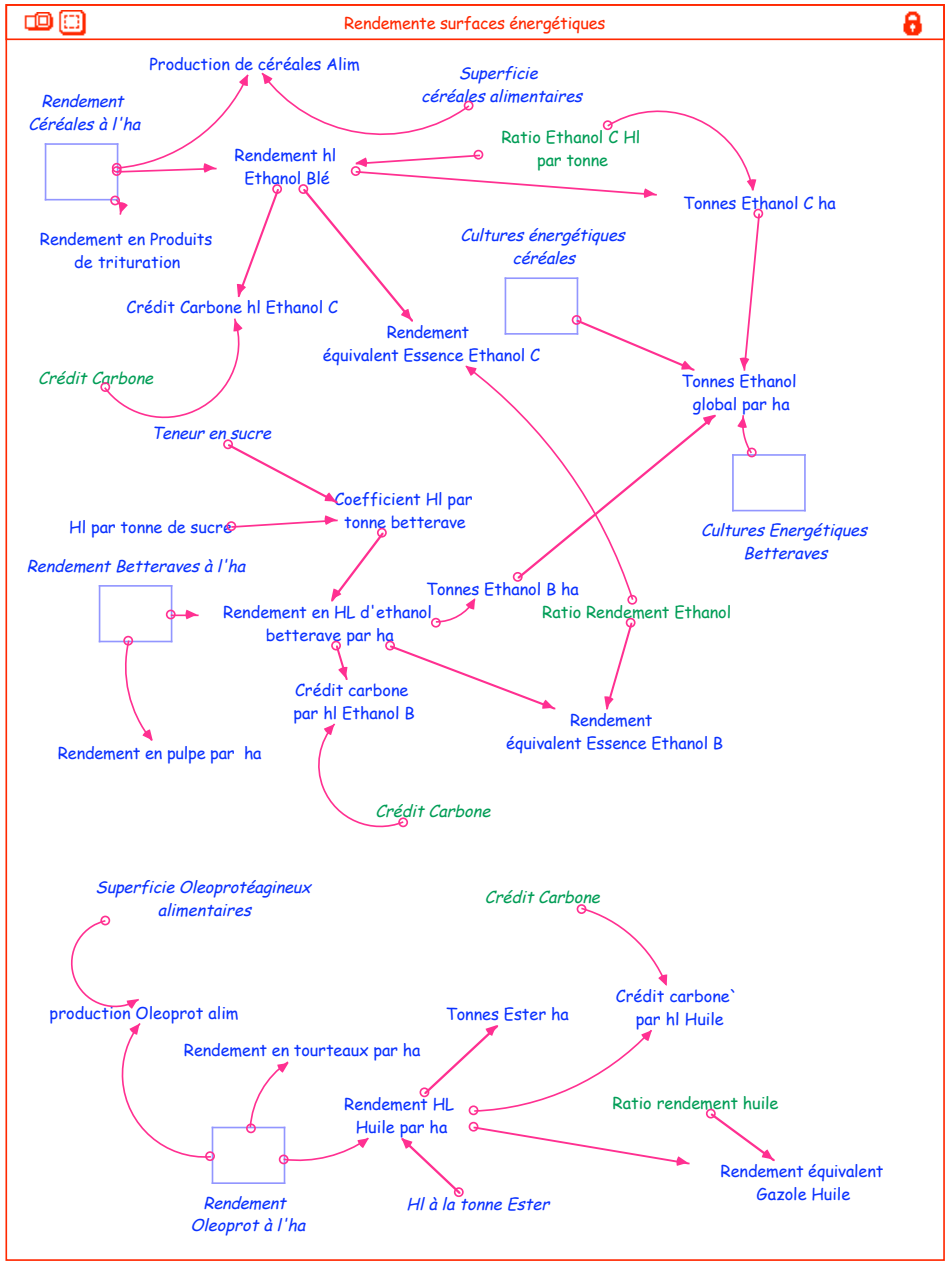
Surface Agricole et utilisation des terres

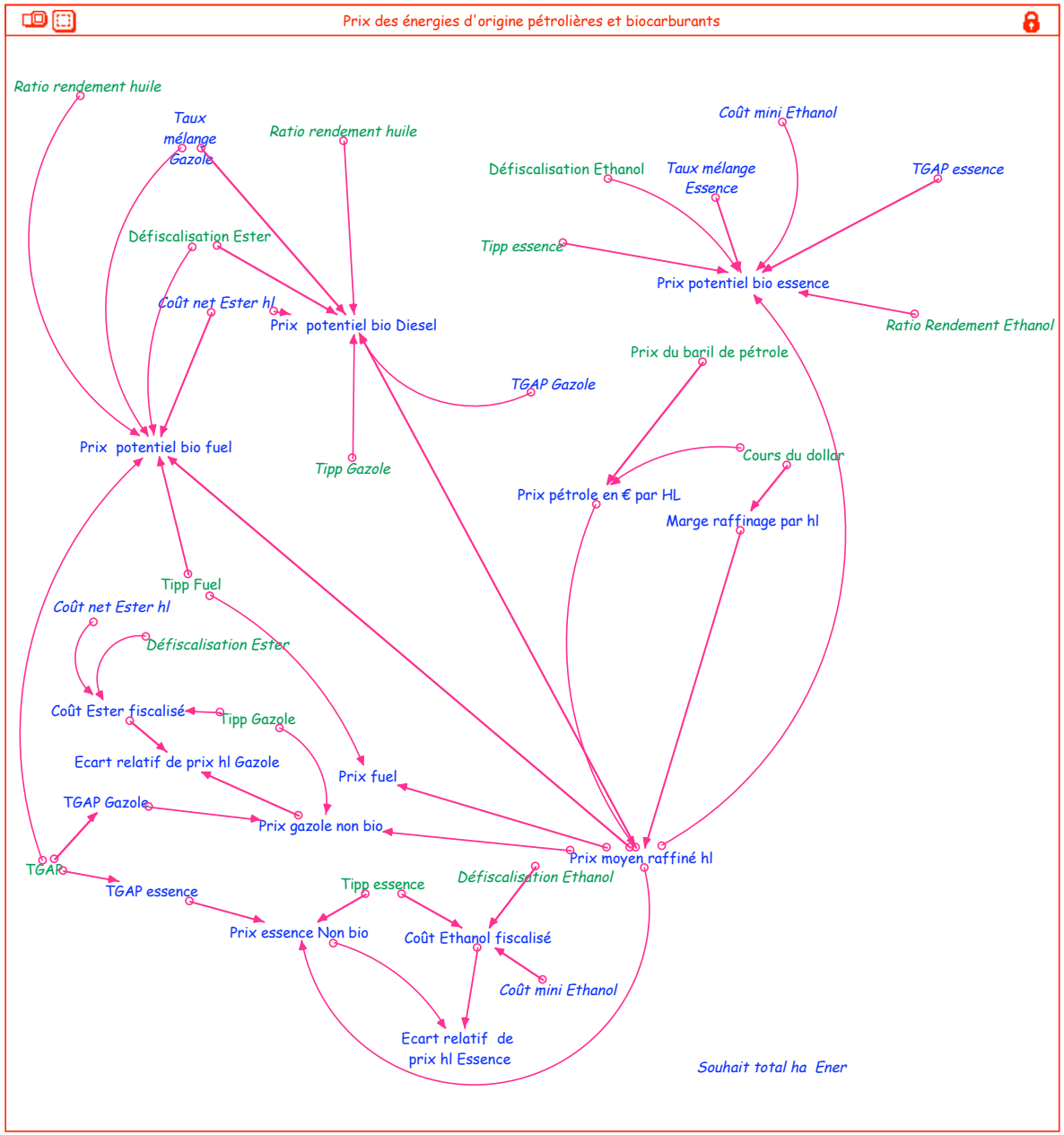


Revenu net agricole

Rendement des surfaces agricoles



Calcul du prix des carburants selon leur origine et les taux de mélange



Calcul des superficies de cultures énergétiques souhaitées

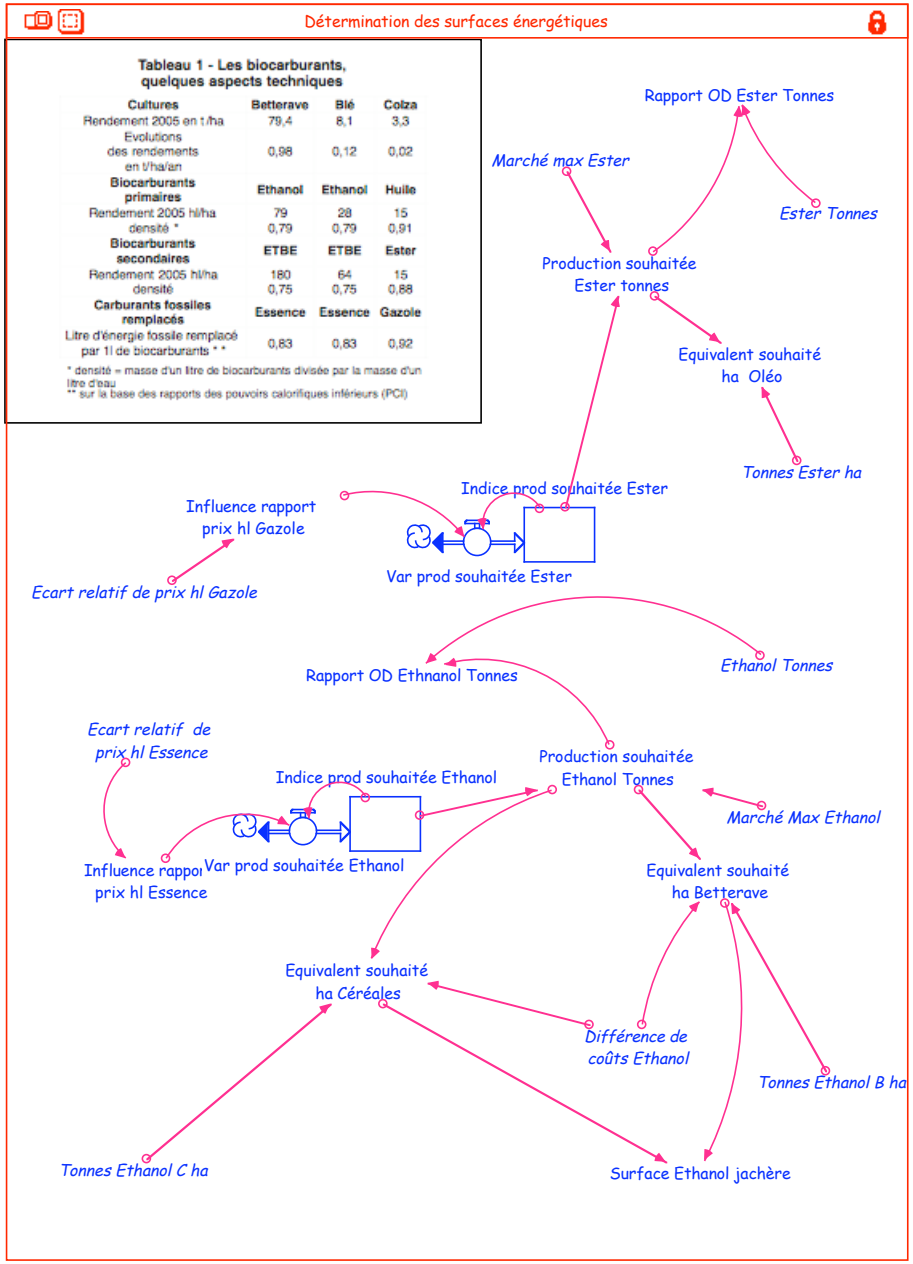
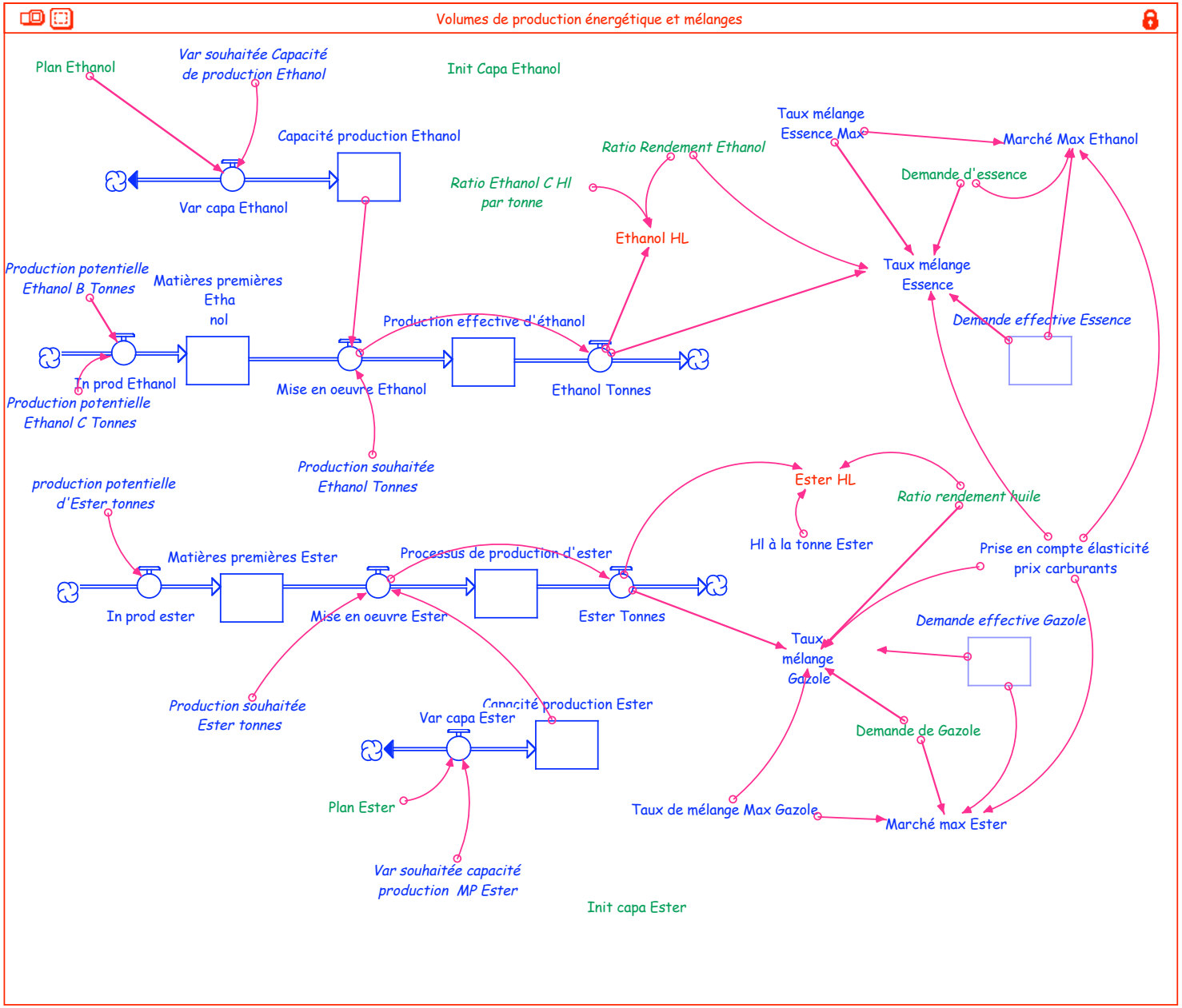


Tableau 1 - Les biocarburants, quelques aspects techniques

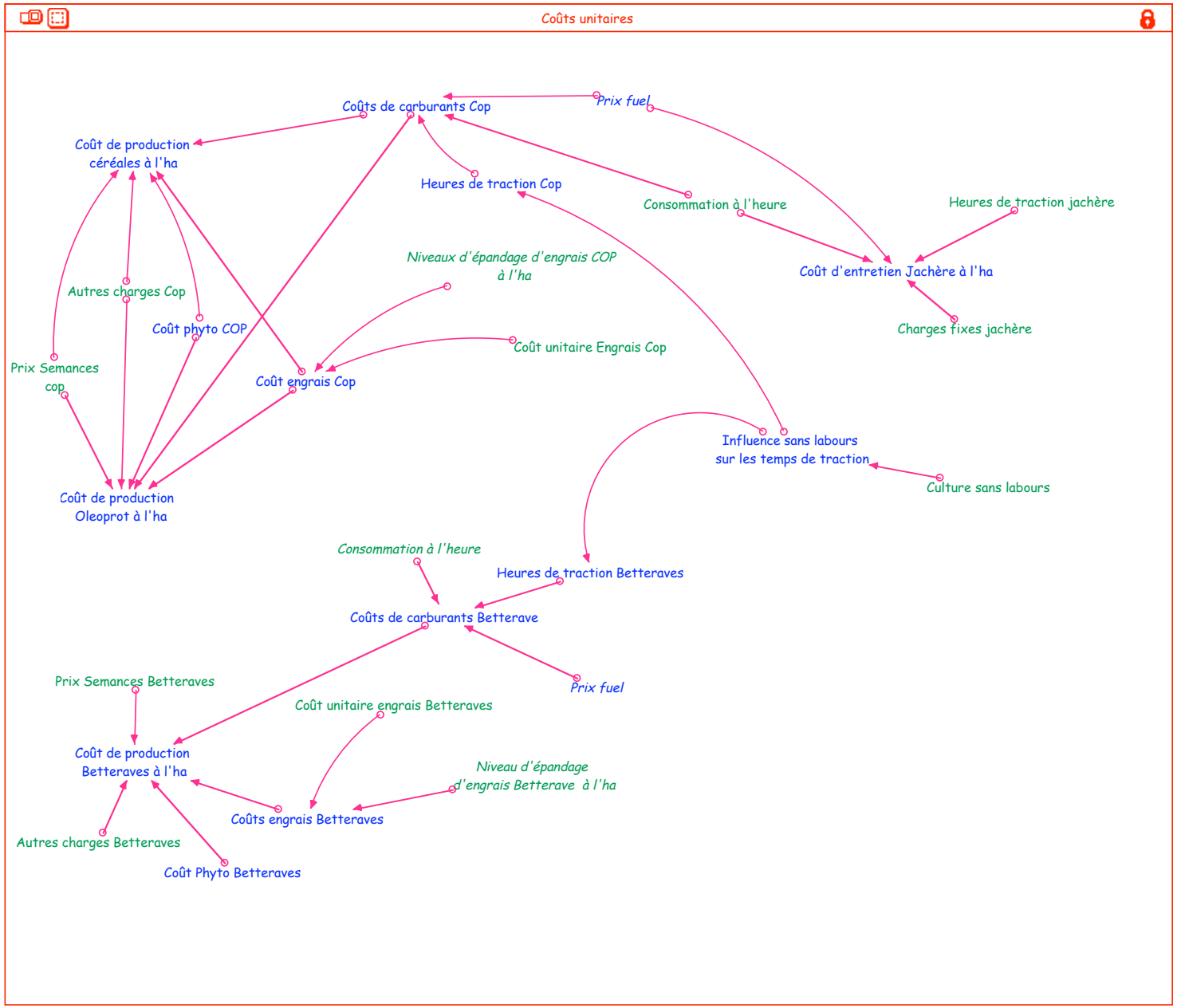
Cultures	Betterave	Blé	Colza
Rendement 2005 en t/ha	79,4	8,1	3,3
Evolutions des rendements en t/ha/an	0,98	0,12	0,02
Biocarburants primaires	**Ethanol**	**Ethanol**	**Huile**
Rendement 2005 hl/ha	79	28	15
densité *	0,79	0,79	0,91
Biocarburants secondaires	**ETBE**	**ETBE**	**Ester**
Rendement 2005 hl/ha	180	64	15
densité	0,75	0,75	0,88
Carburants fossiles remplacés	**Essence**	**Essence**	**Gazole**
Litre d'énergie fossile remplacé par 1l de biocarburants * *	0,83	0,83	0,92

* densité = masse d'un litre de biocarburants divisée par la masse d'un litre d'eau
** sur la base des rapports des pouvoirs calorifiques inférieurs (PCI)

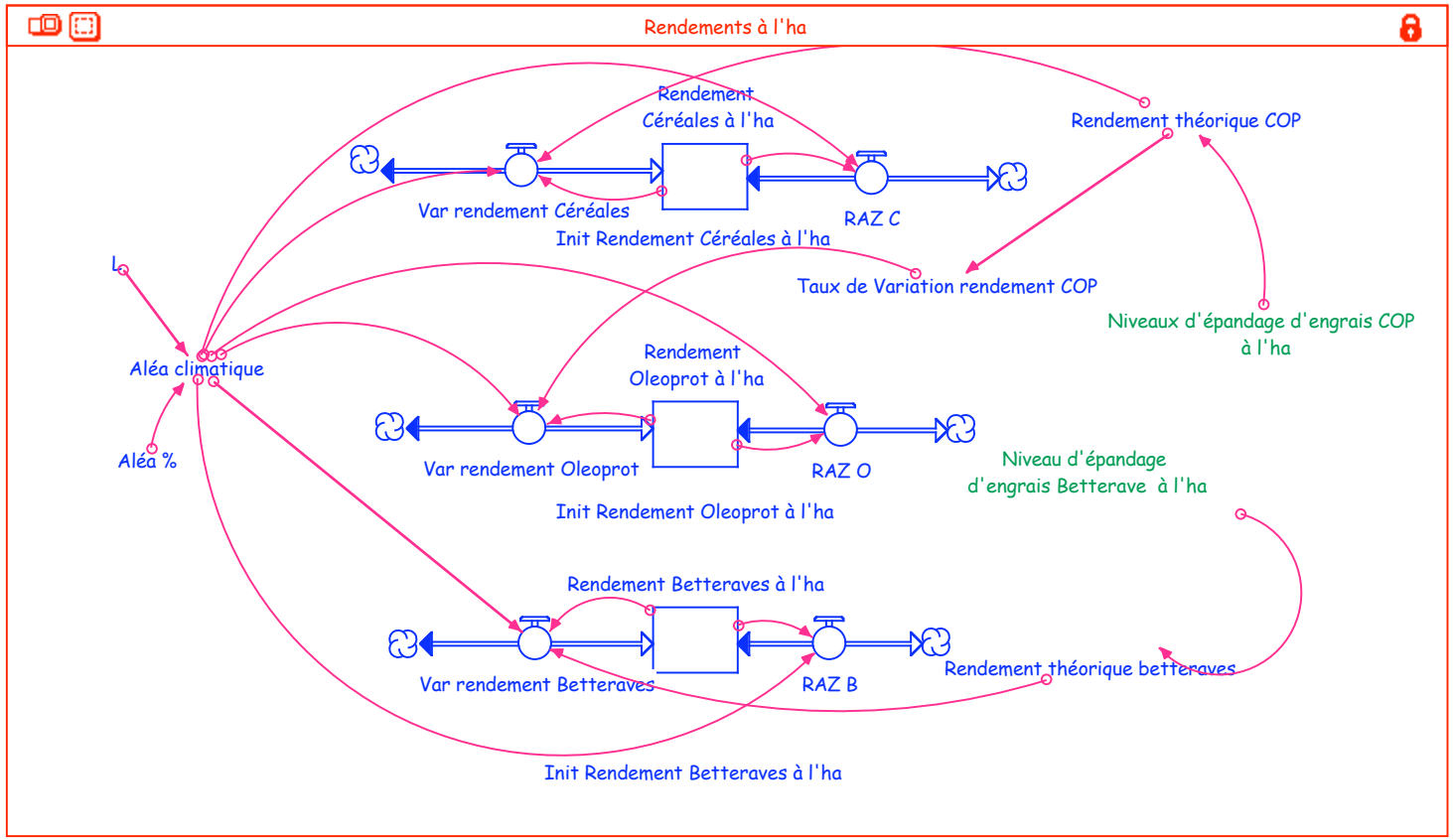
Calcul des productions réelles de bio-carburants



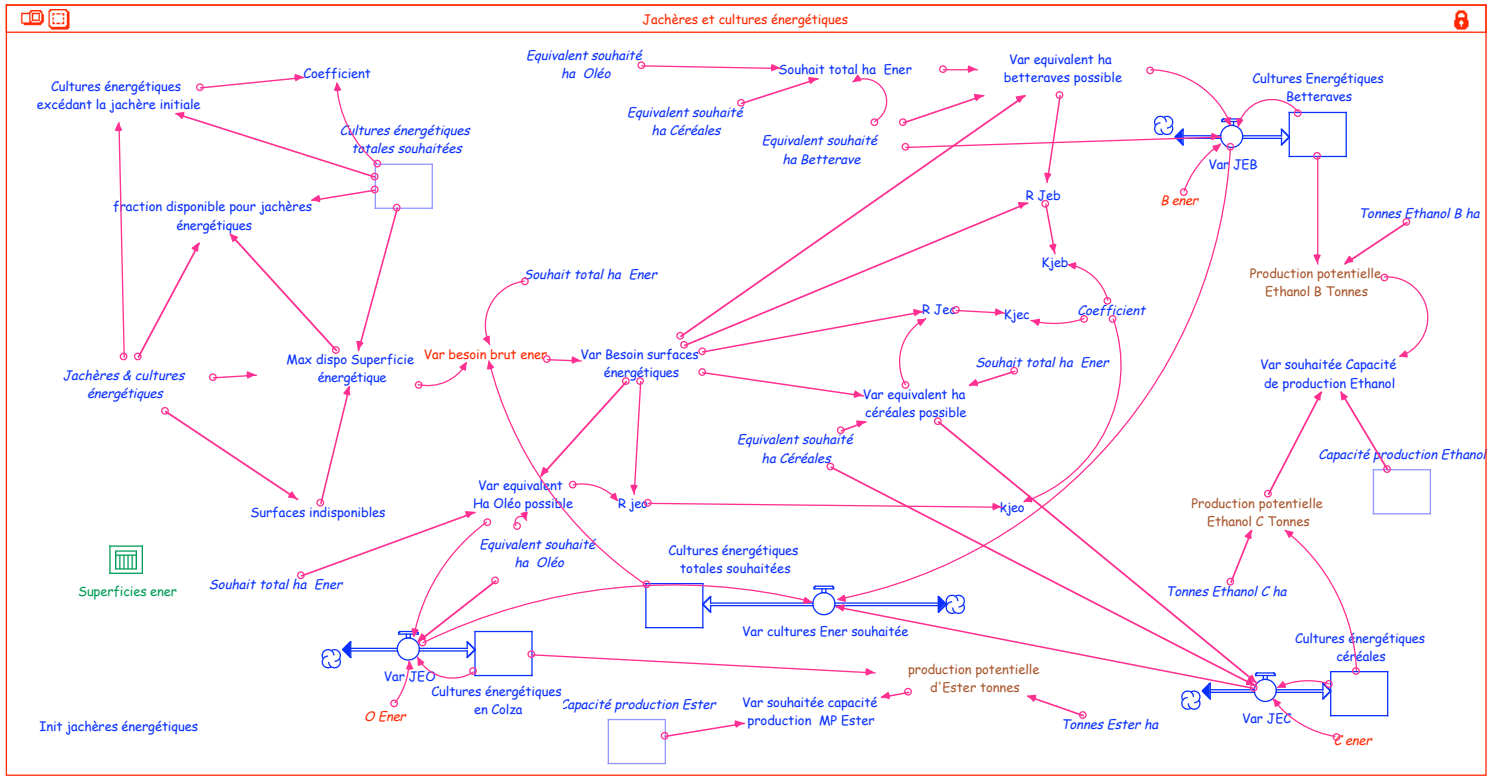
Calcul des coûts unitaires de production des bio-carburants



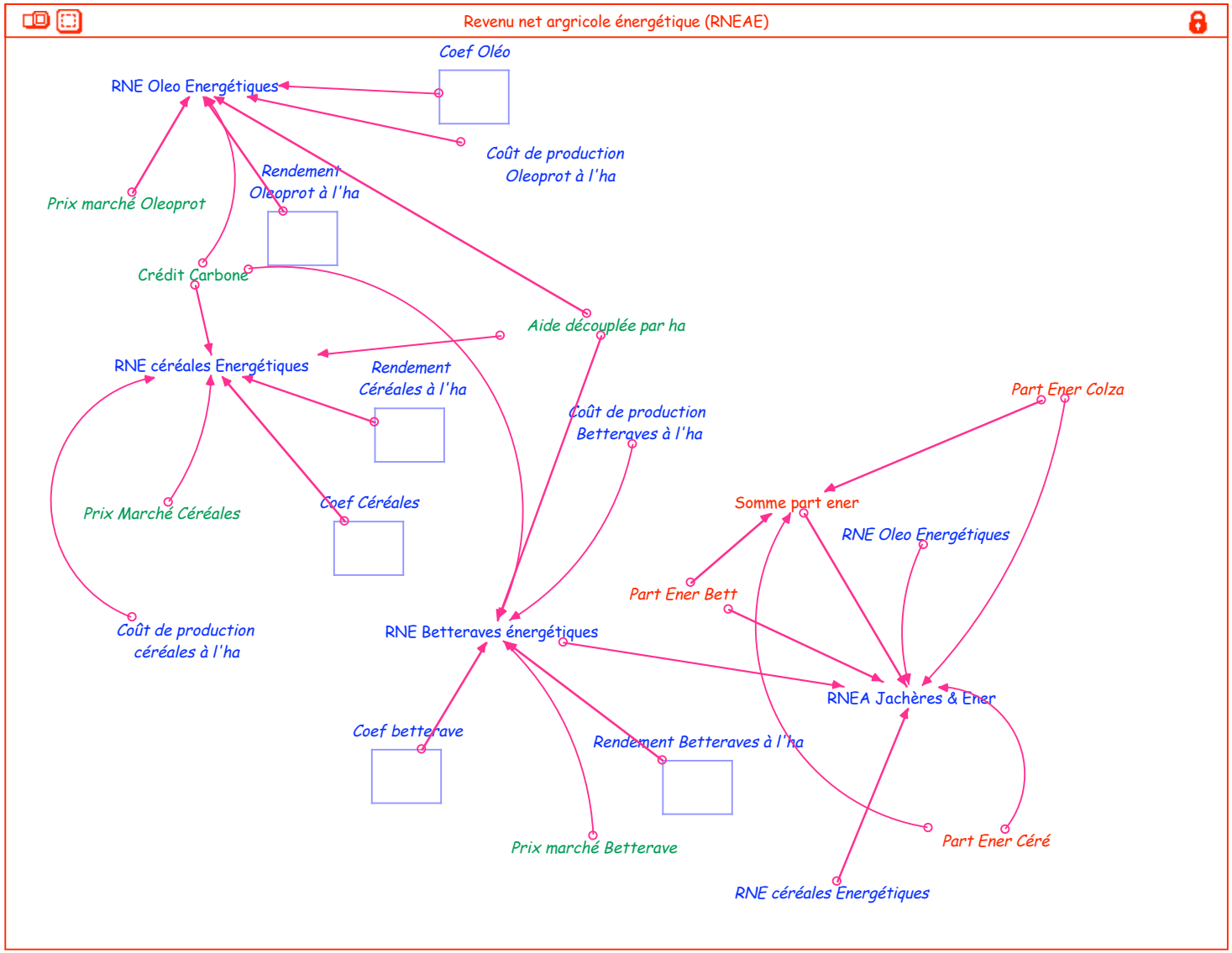
Rendements à l'ha des grandes cultures



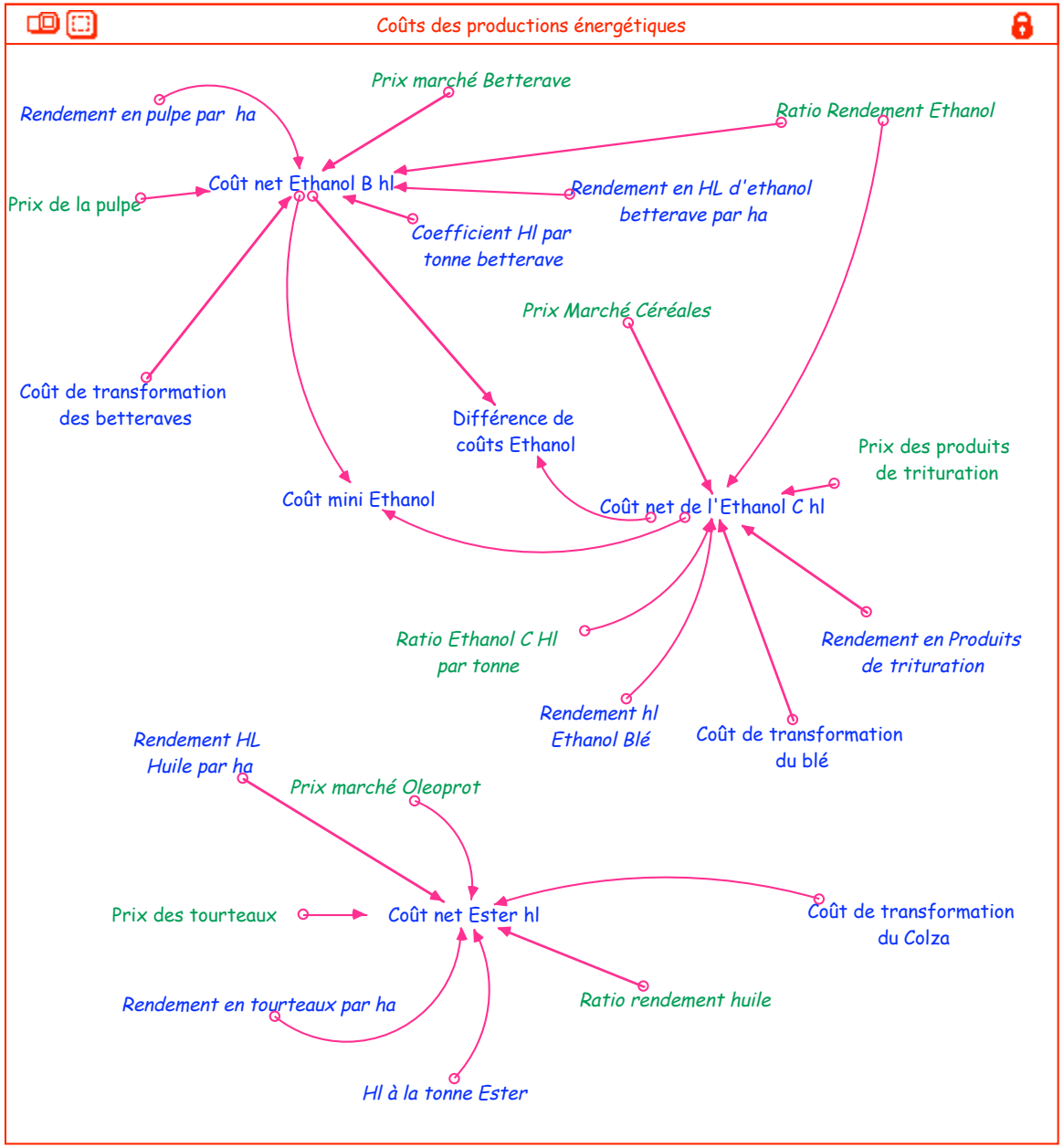
Jachères et cultures énergétiques



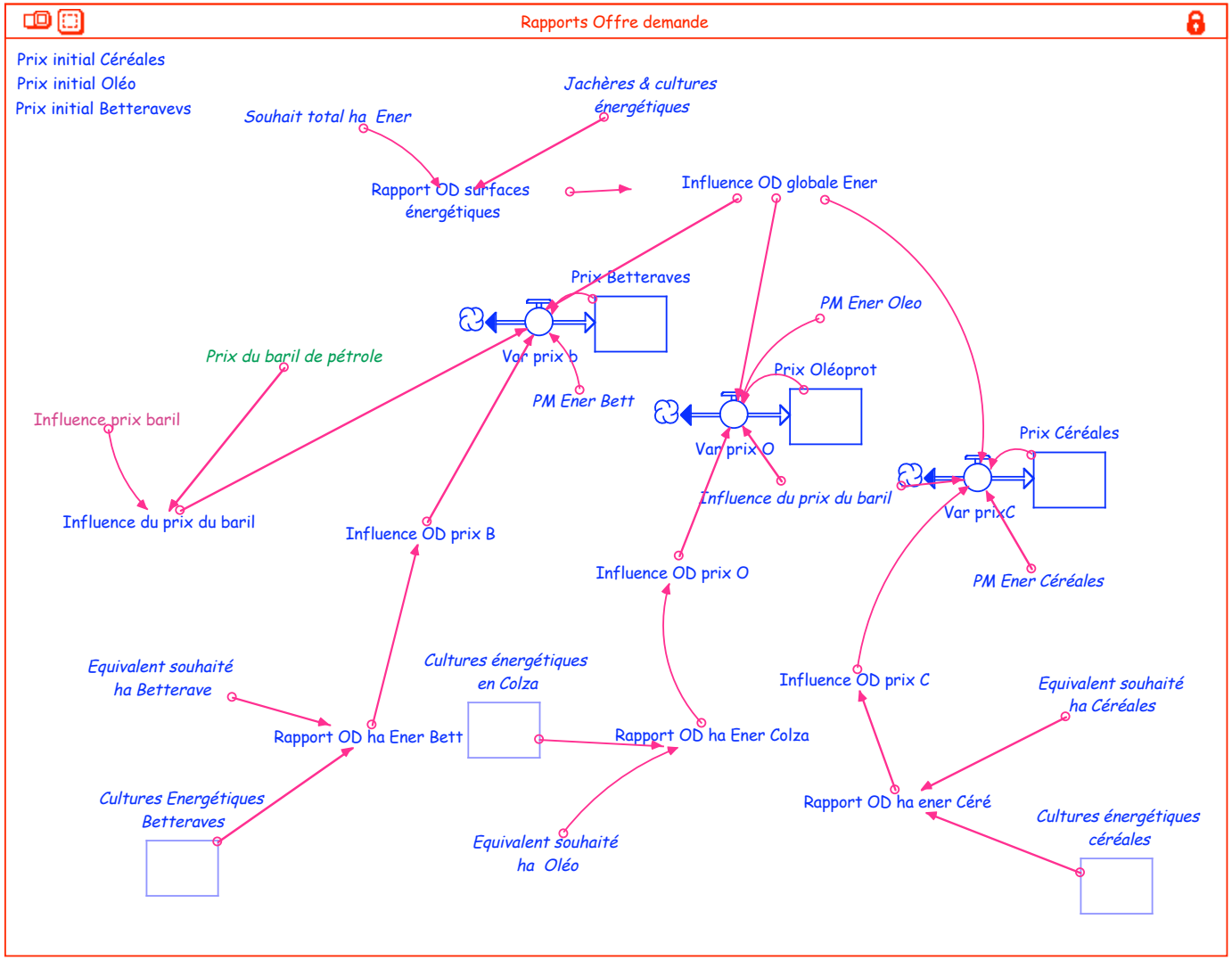
Revenu net agricole énergétique



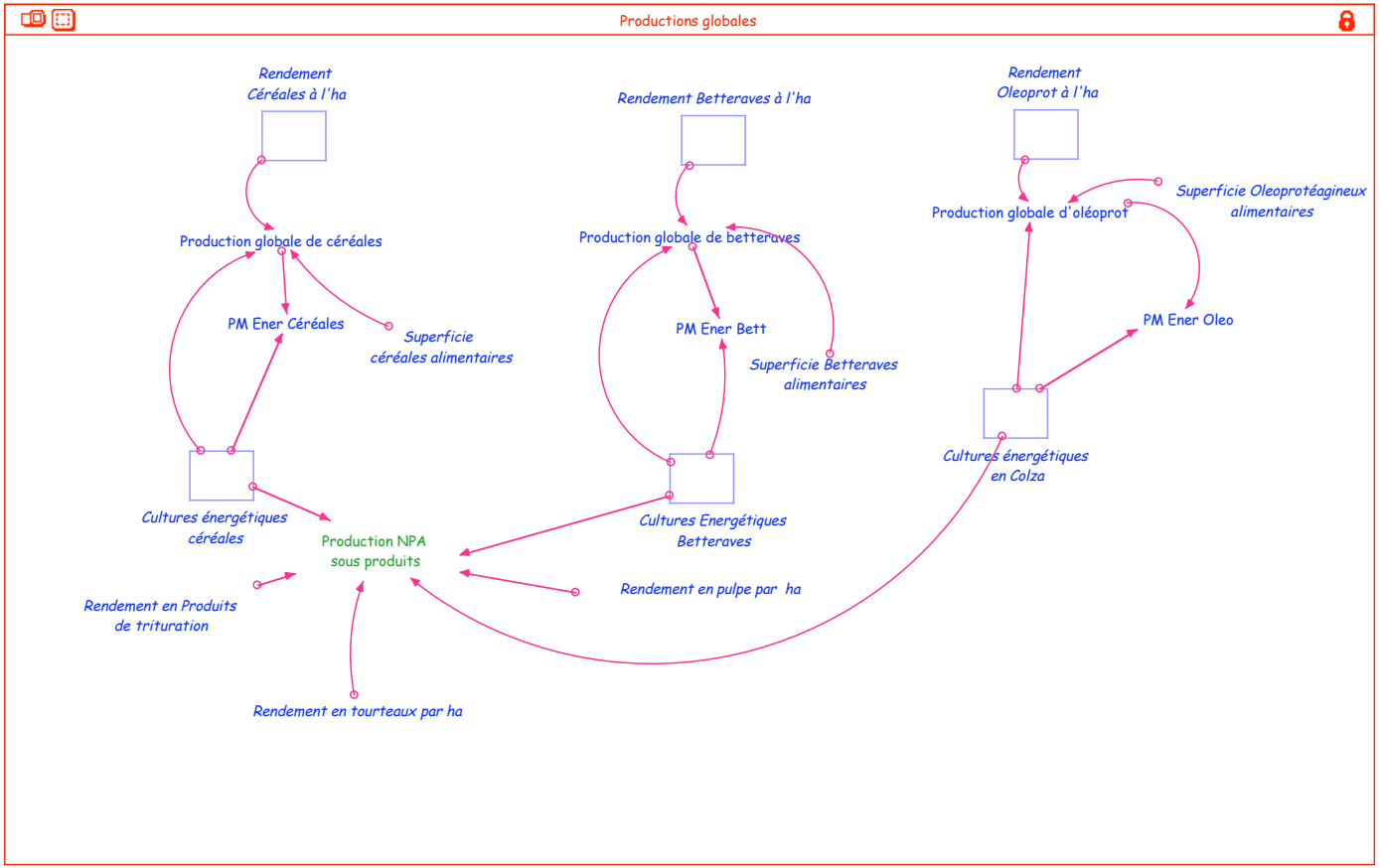
Coûts des productions énergétiques



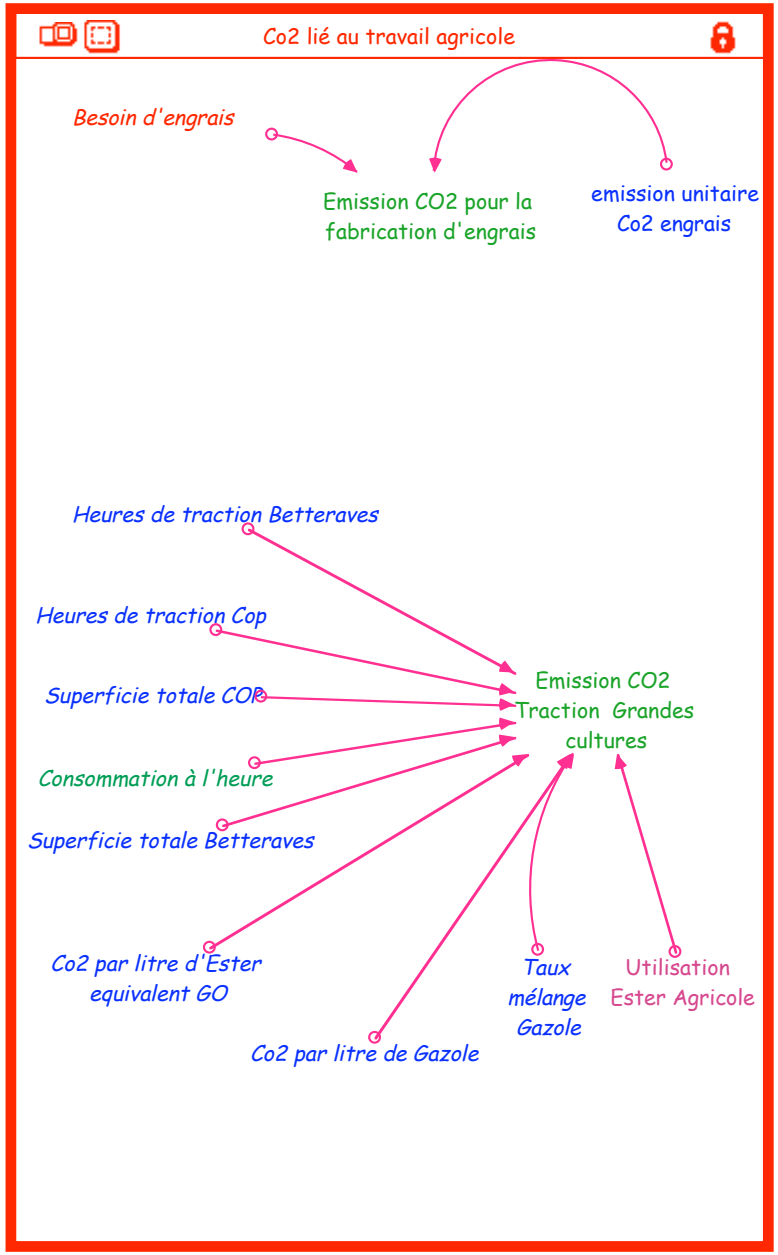
Rapports offre-demande et prix des produits



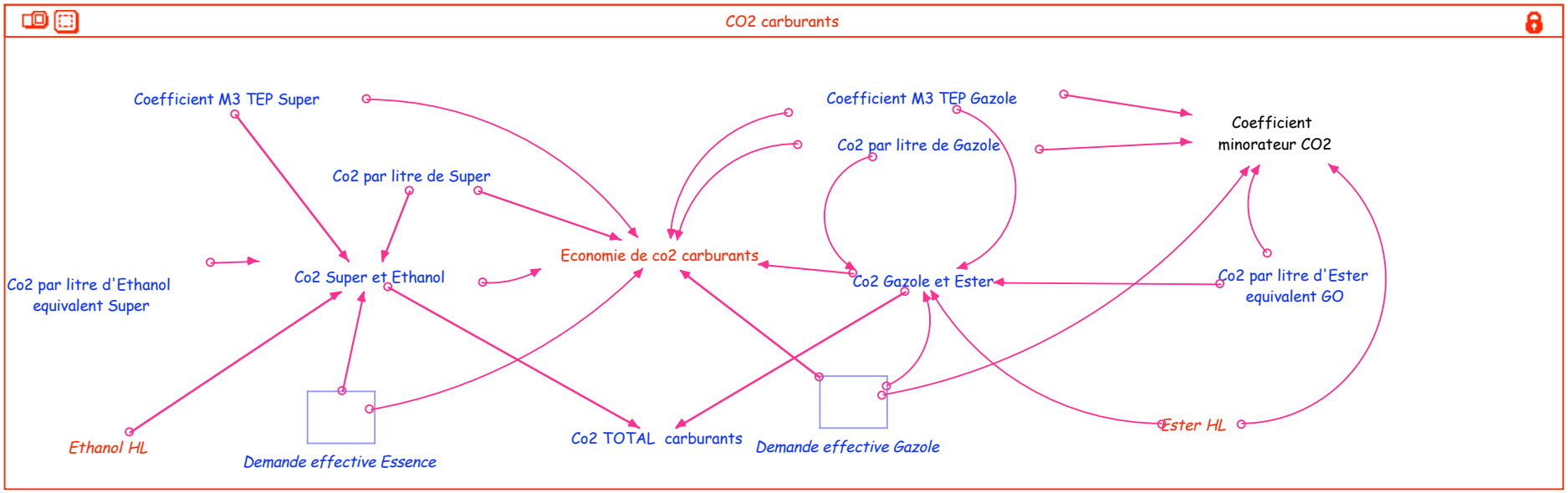
Productions globales des grandes cultures



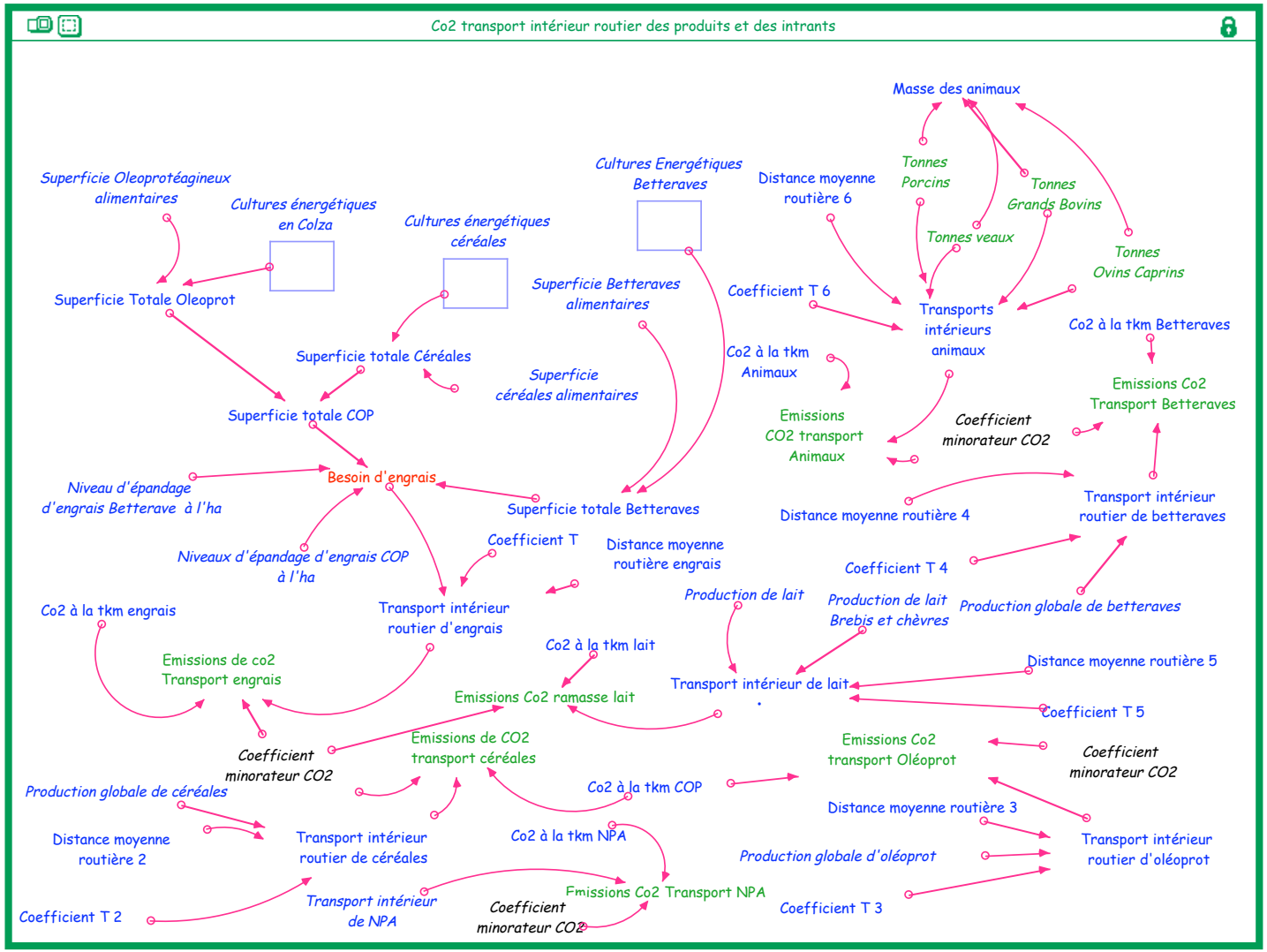
Co2 lié au travail agricole



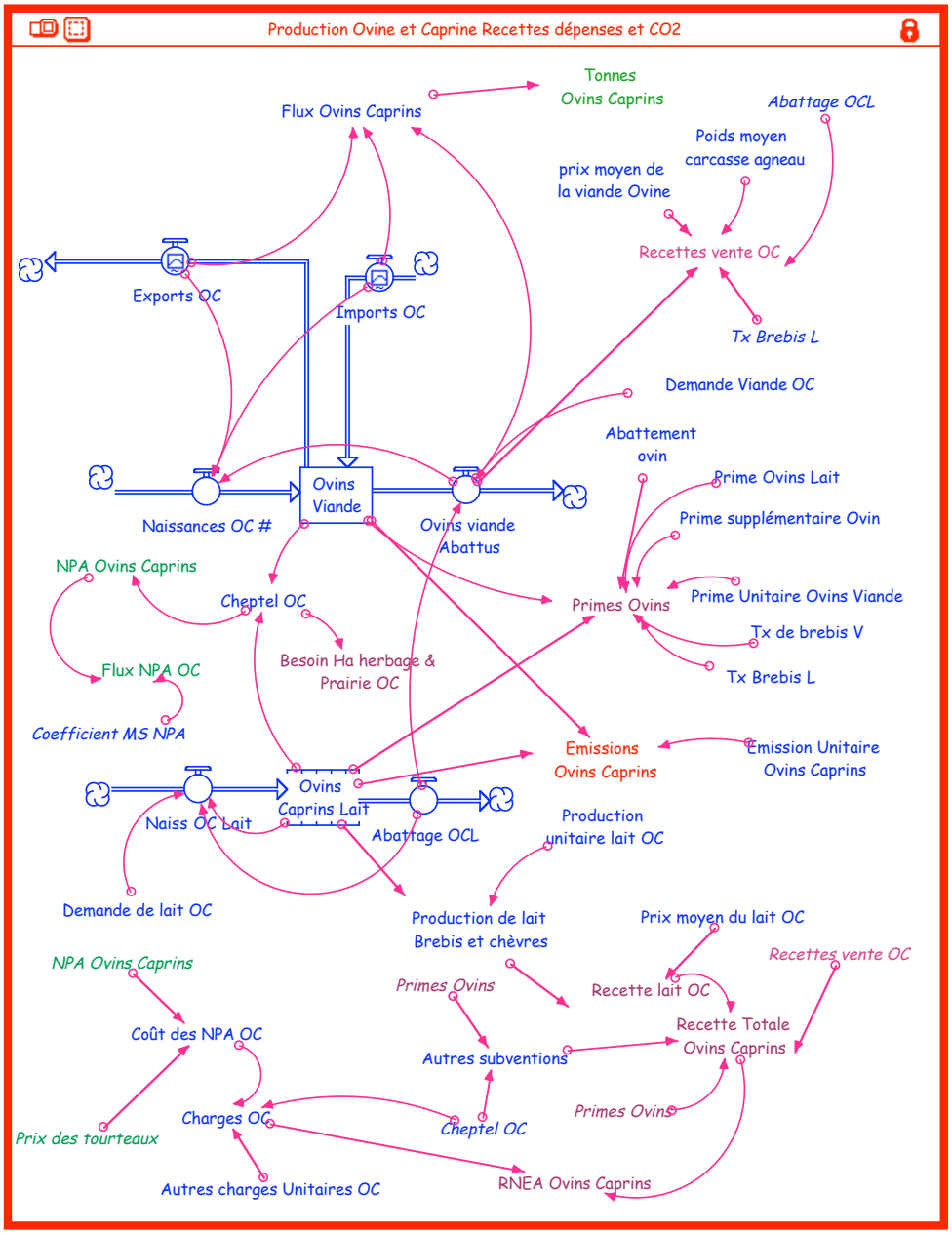
Co2 émis par la combustion des carburants



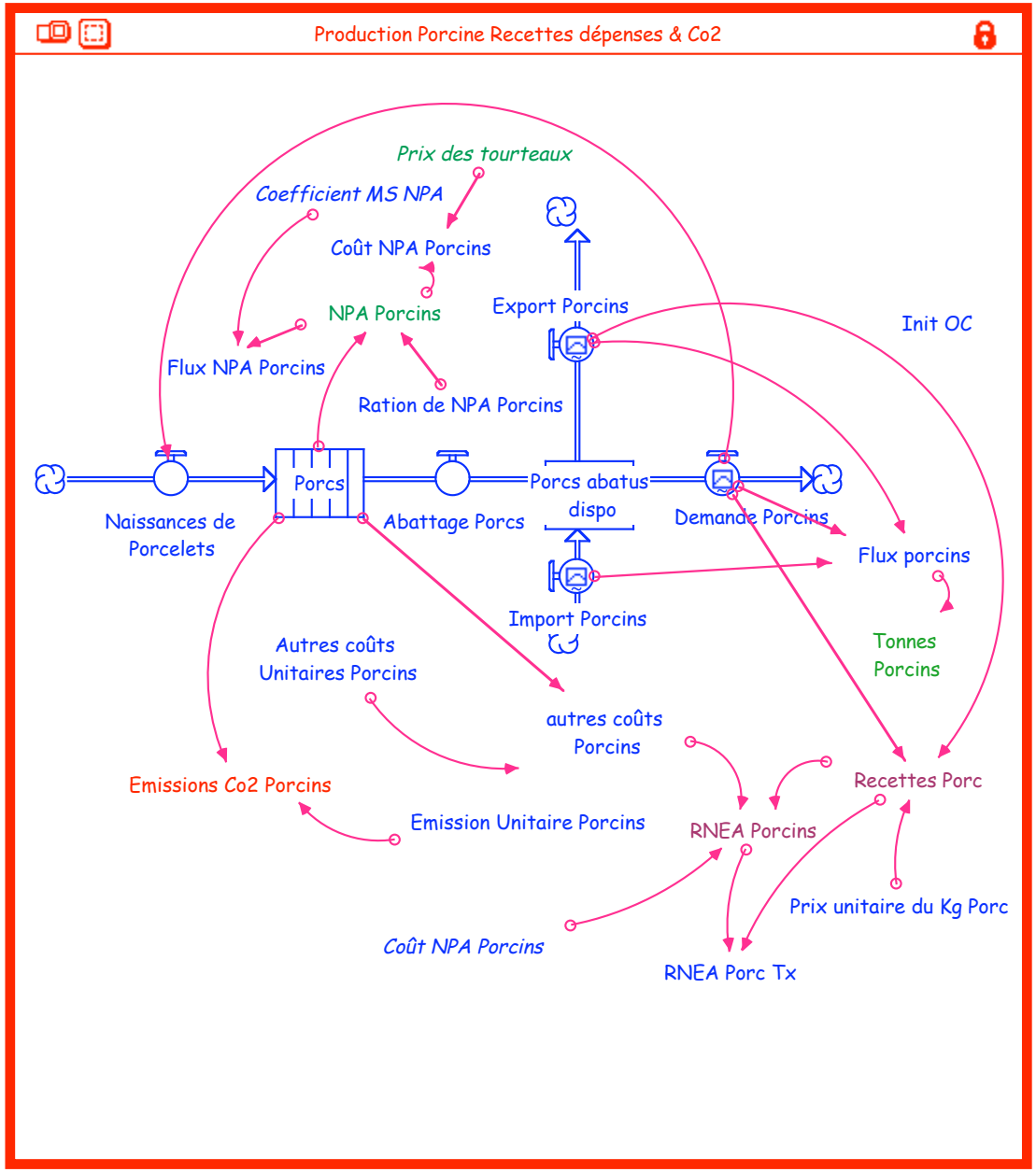
Co2 émis par le transport intérieur des produits et des intrants



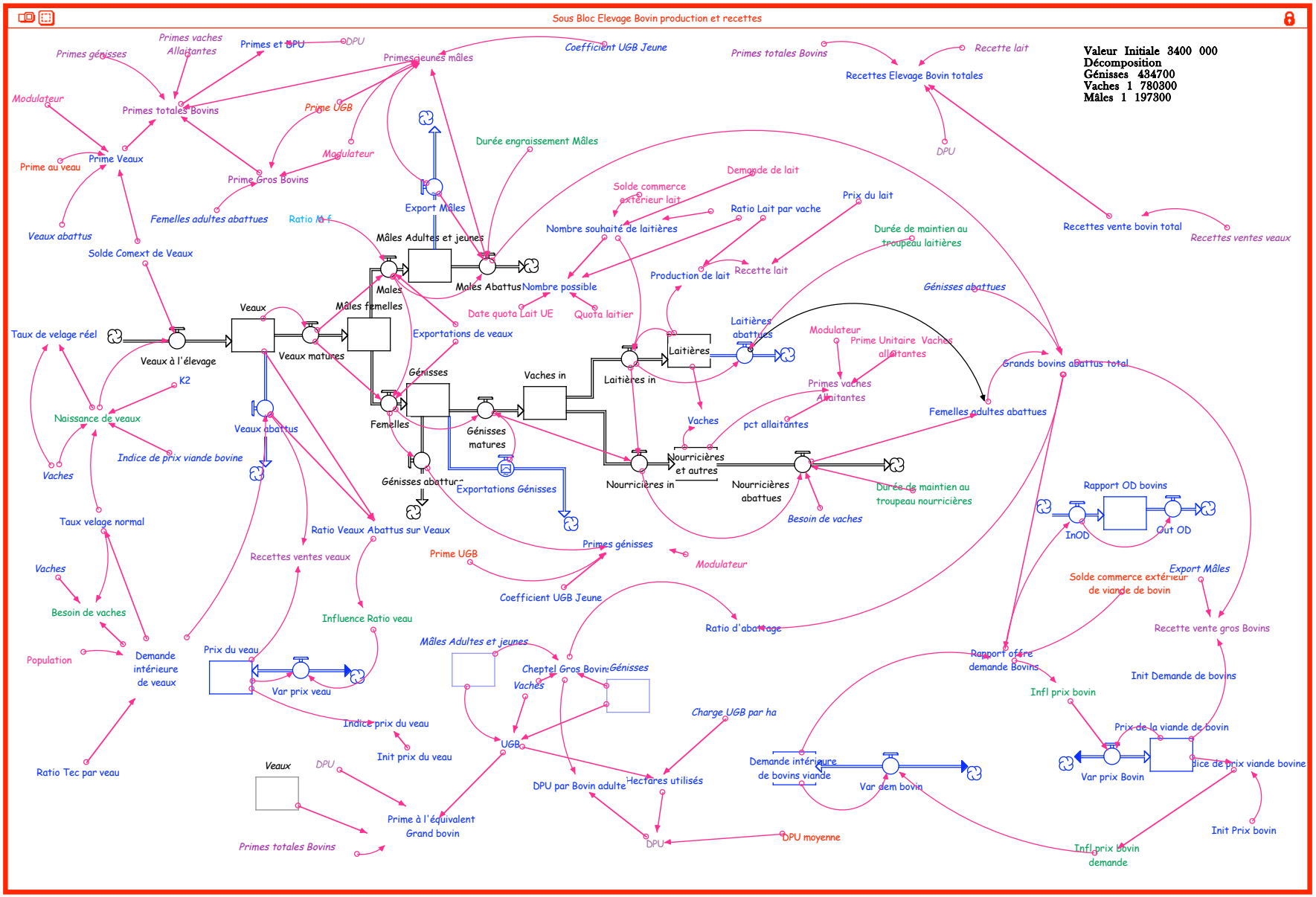
Production ovine & caprine



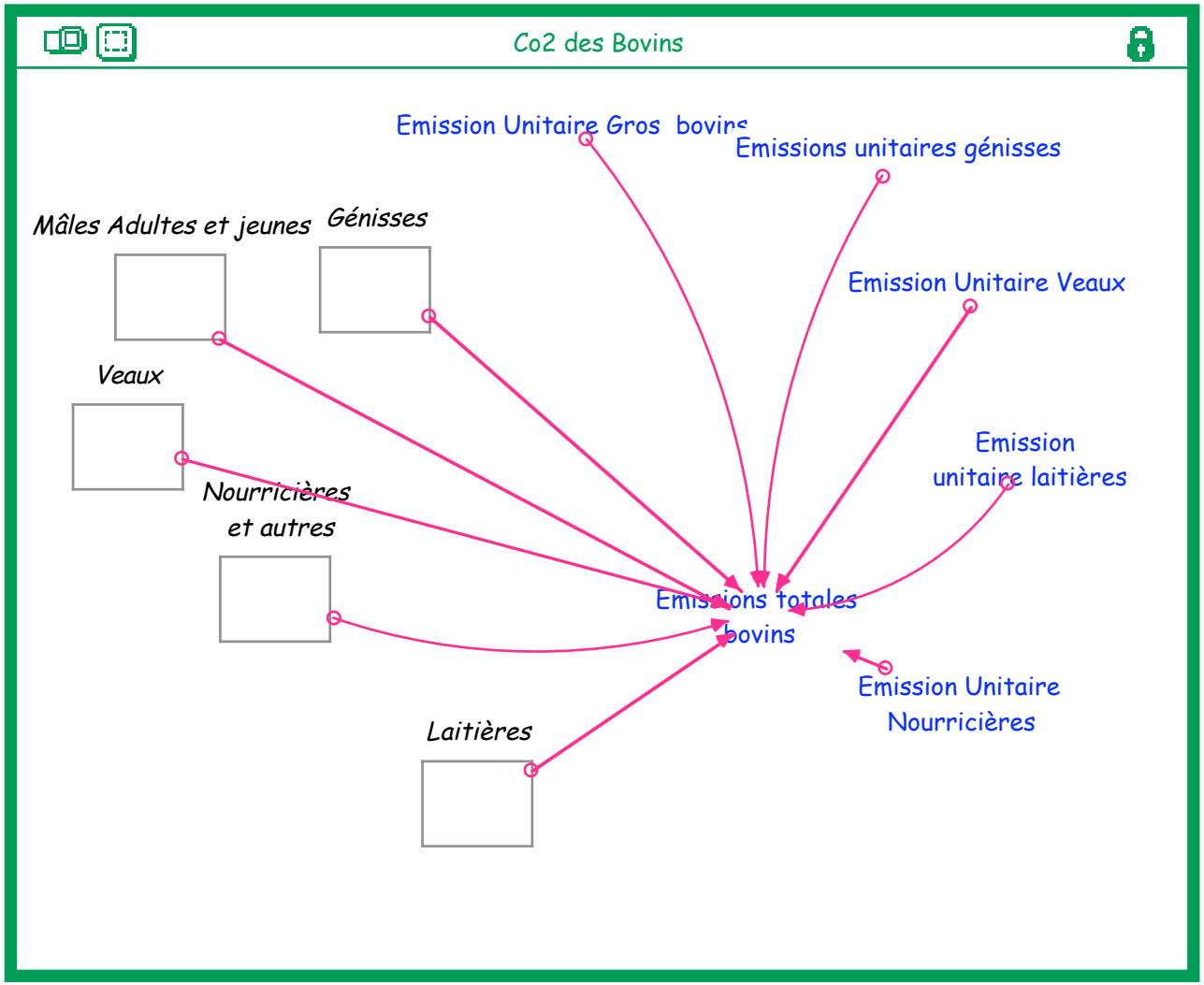
Production porcine



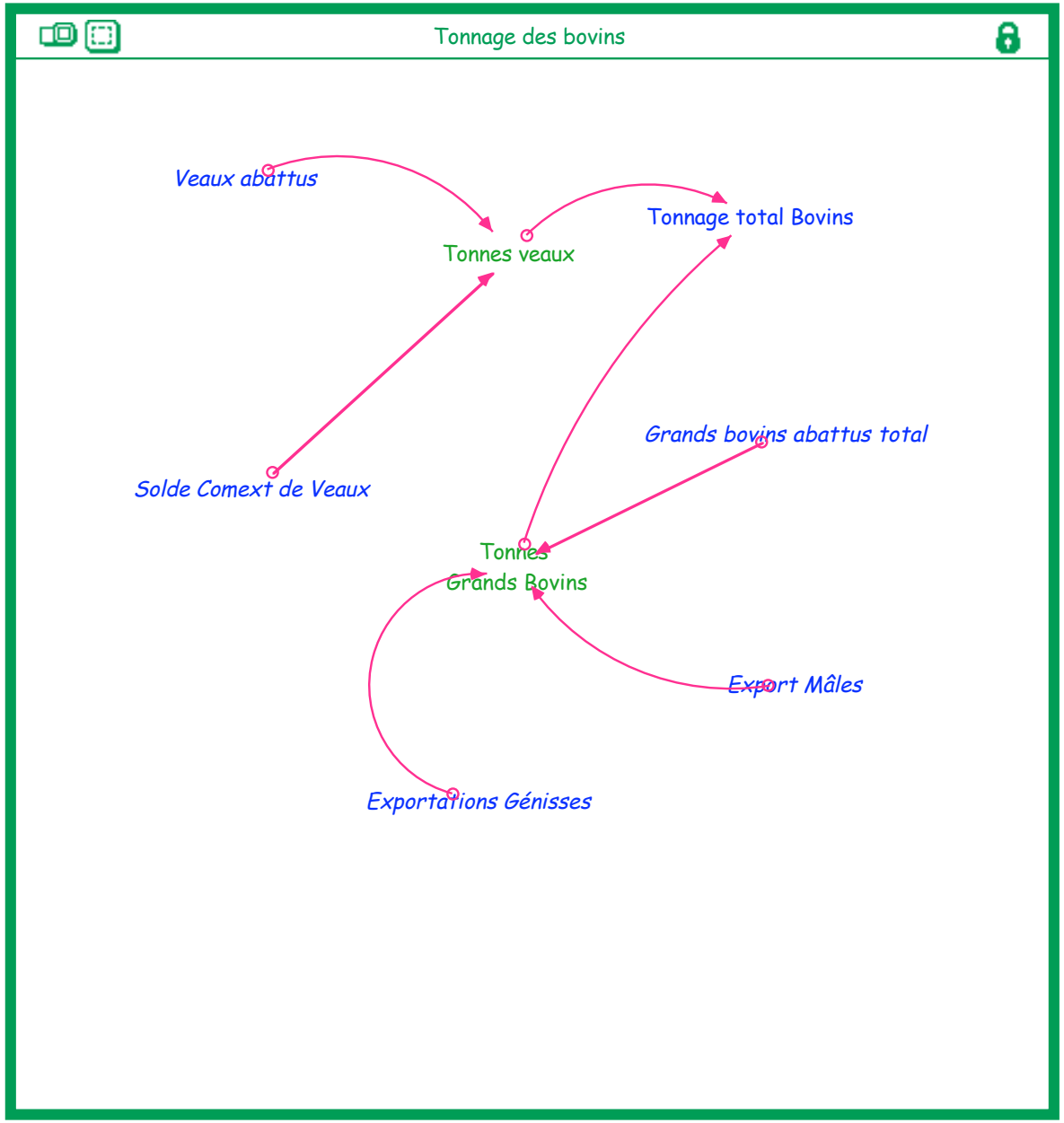
Production bovine



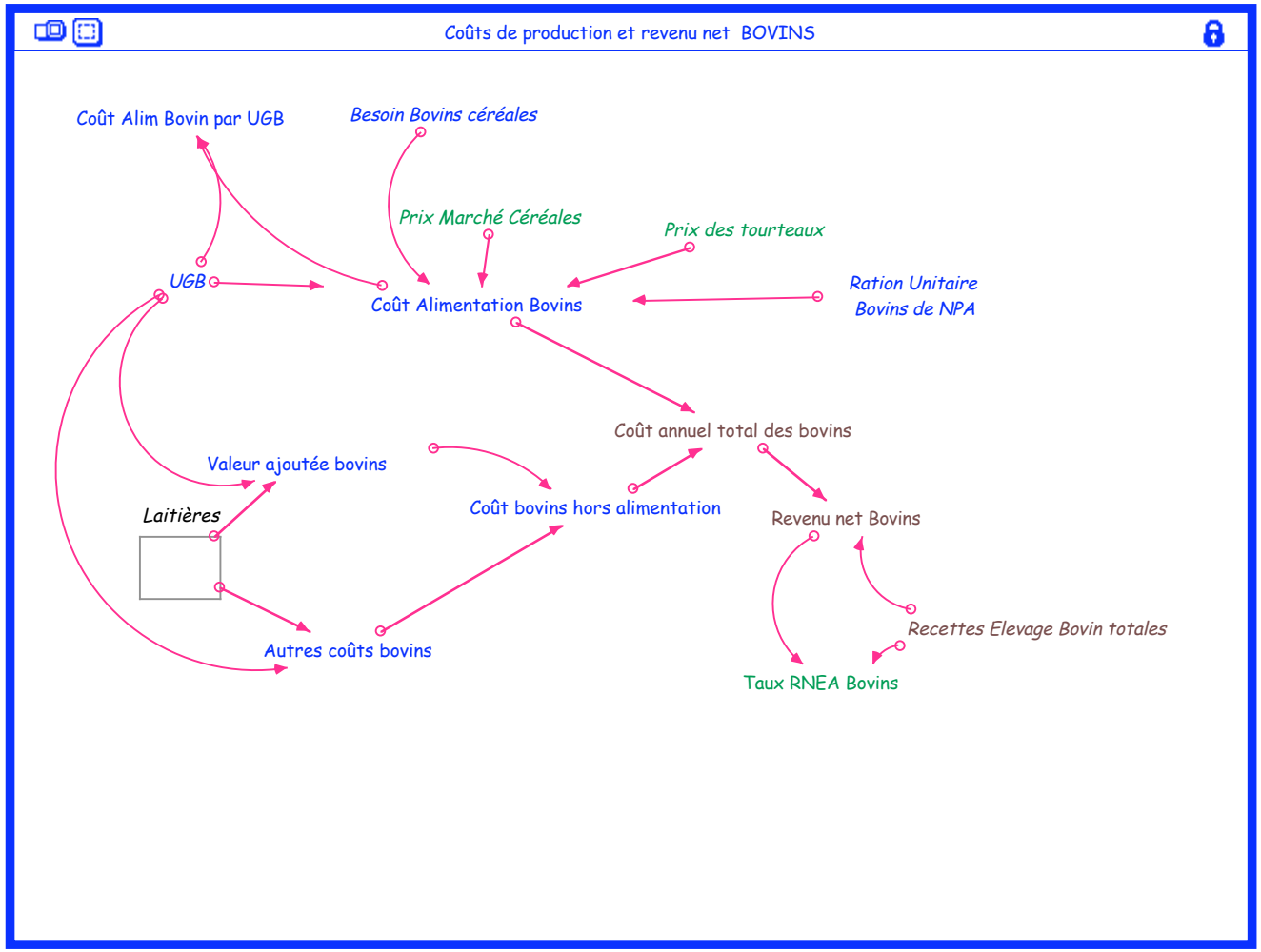
Co2 lié à la production bovine



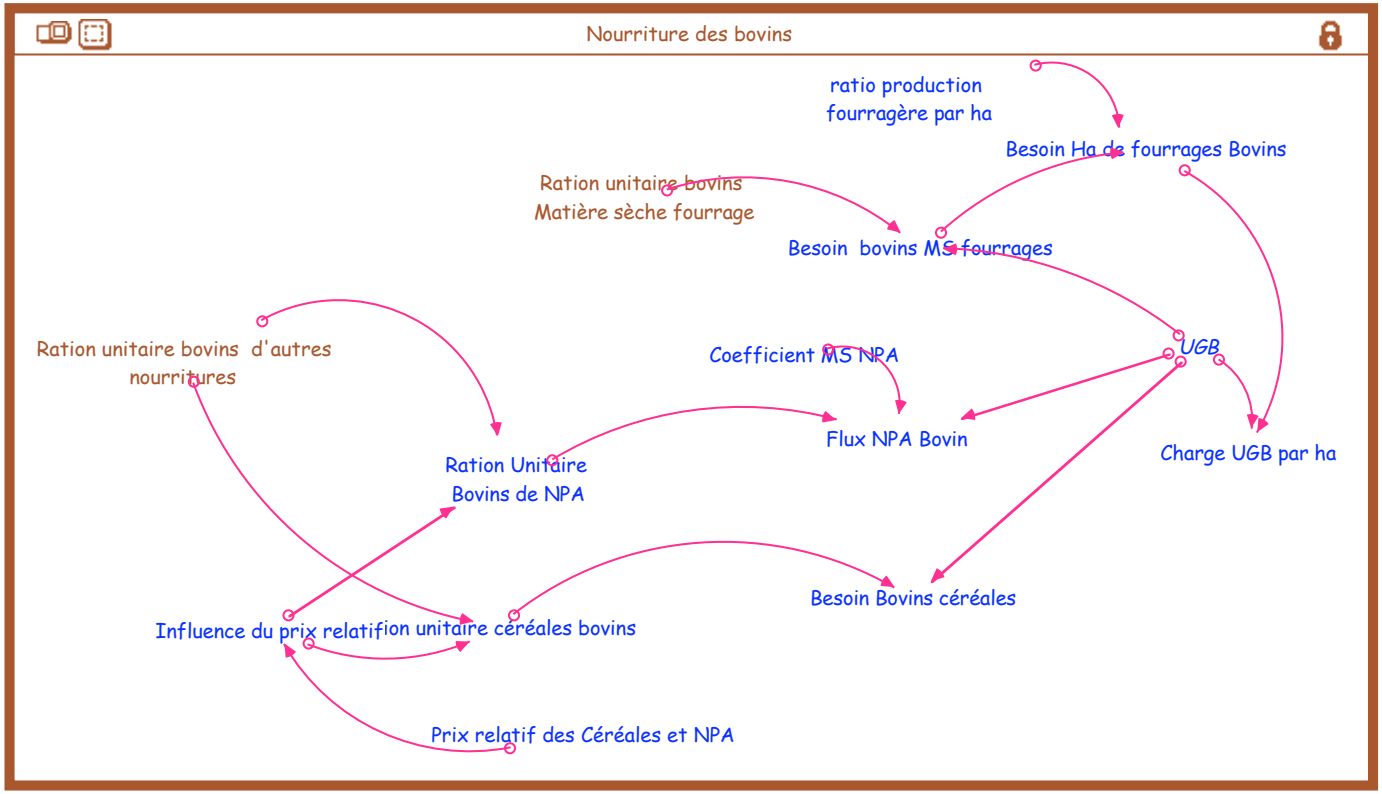
“Tonnage” bovin



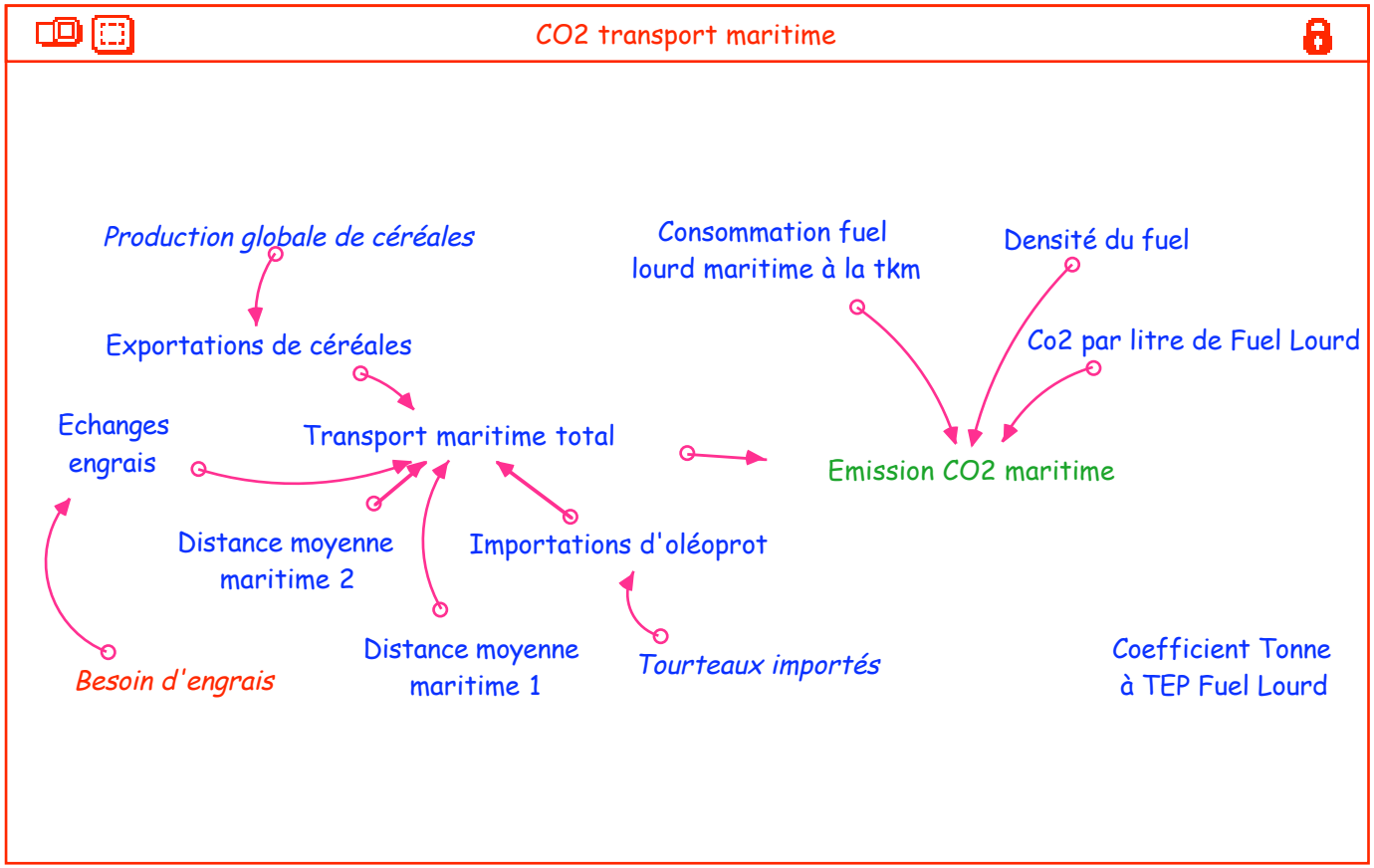
Coûts et revenu net de l'élevage bovin



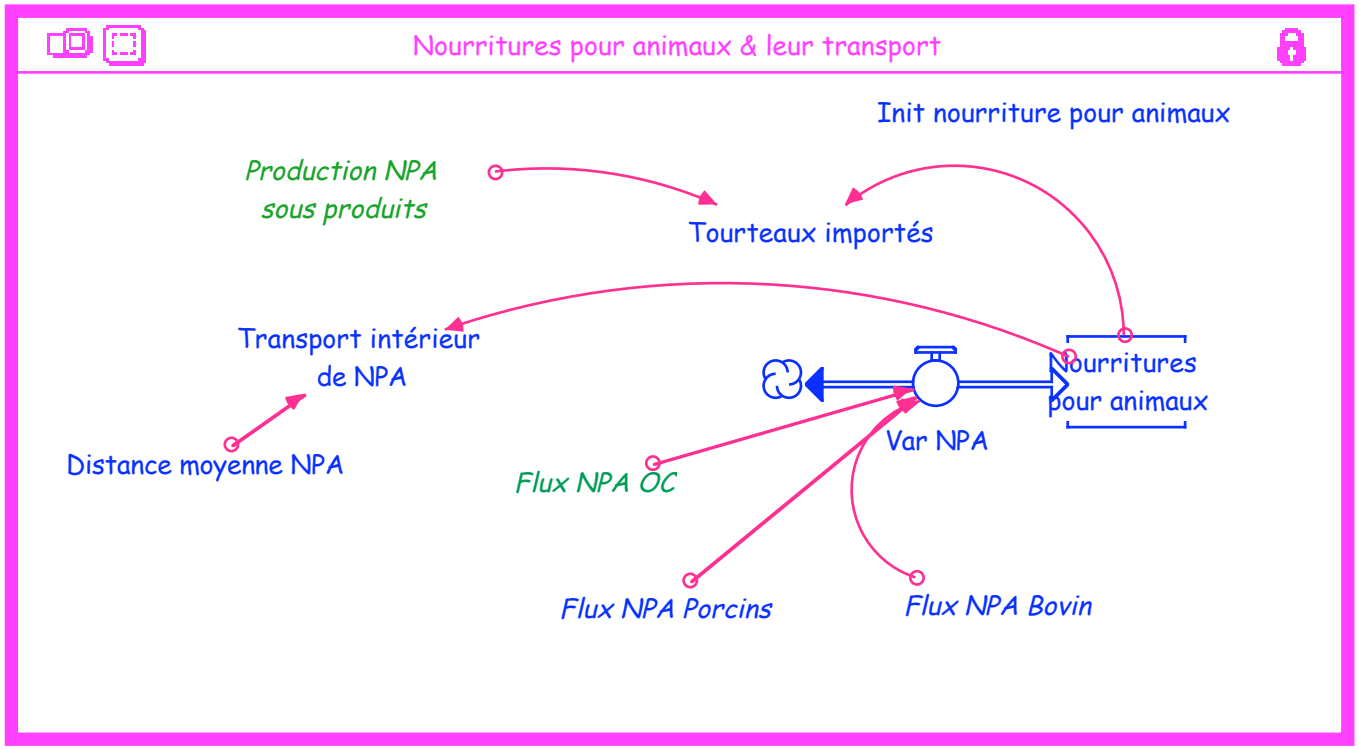
Nourriture des bovins

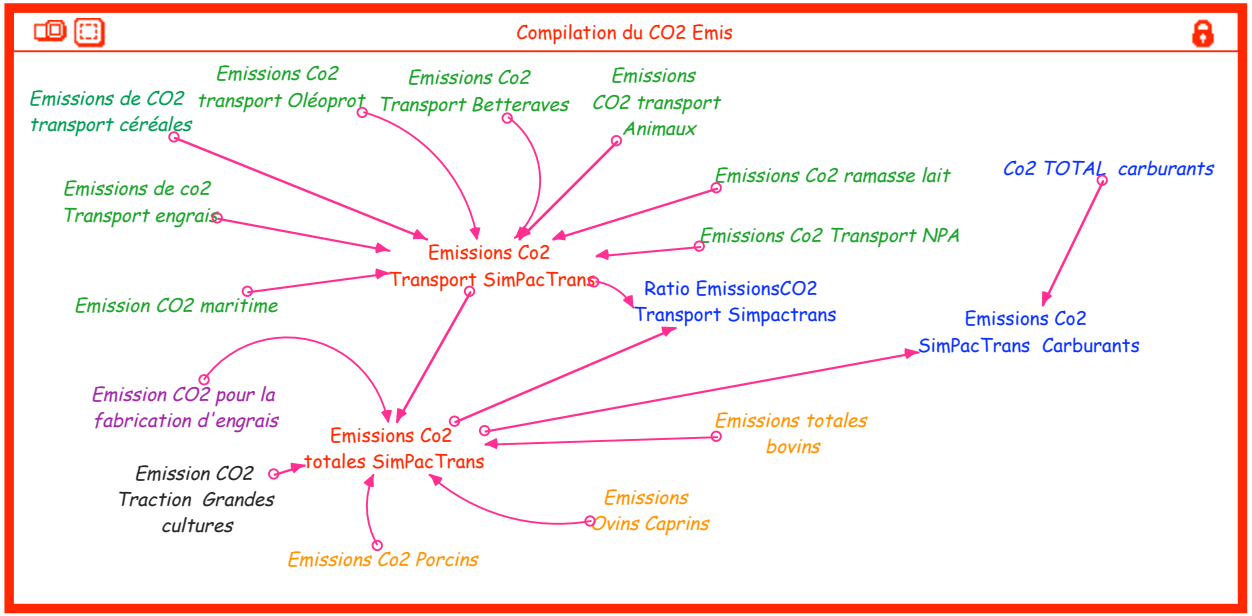


Transport maritime et CO2 lié



Nourritures pour animaux et leur transport





Compilation du CO2 émis SimPacTrans (activités agricoles modélisées et transport amont et aval) Carburants (total économie)