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## List of Abbreviations

1G	First generation
2G	Second generation
3G	Third generation
4G	Fourth generation
AFS/FS	Farnesene synthase
ASTM	American Society of Testing and Materials
AtoB	Acetoacetyl-CoA thiolase
bom	Basis of mobility
CapEx	Capital expenditure
CBB	Coffee berry borer
Chl <sup>R</sup>	Chloramphenicol resistance gene
CpcB	$\beta$ -subunit of phycocyanin
CRISPR	Clustered regularly interspaced short palindromic repeats
DCW	Dry cell weight
DMAPP	Dimethylallyl diphosphate
DPOAEs	Distortion product otoacoustic emissions
DPPH	2,2-diphenyl-1-picryl-hydrazyl
DXP	1-deoxy-D-Xylulose-5-phosphate
DXR	DXP reductoisomerase
dxs	1-deoxy-D-Xylulose-5-phosphate synthase
EBF	(E)- $\beta$ -farnesene
ENDS	Electronic nicotine delivery systems
FID	Flame ionization detector
FOC	Fixed operating cost
FP	Forward primer
FPP	Farnesyl diphosphate
FPPS/ispA	Farnesyl diphosphate synthase
FSLFPPS	Fusion of FS and FPPS genes by linker
GAP	Glyceraldehyde 3-phosphate
GC	Gas chromatography
GGPP	Geranyl geranyl diphosphate
GHG	Greenhouse gas
GPP	Geranyl diphosphate
GPPS	GPP synthase
GLS	Geranylgeranyl synthase
HMBPP	4-hydroxy-3-methylbut-2-enyldiphosphate
HMG-CoA	4-hydroxy-3-methyl-glutaryl-CoA
HMGs	HMG-CoA synthase
HMGR	HMG-CoA reductase
IC <sub>50</sub>	Half-maximal inhibitory concentration
idi	Isopentenyl diphosphate isomerase

idispA	Fusion of <i>idi</i> and <i>ispA</i> genes by linker
IM	Isopropyl myristate
IspG	HMBPP synthase
IspH	HMBPP reductase
IPP	Isopentenyl diphosphate
IPTG	Isopropyl- $\beta$ -D-thiogalactopyranoside
IspS	Isoprene synthase
kan <sup>R</sup>	Kanamycin resistance
K <sub>cat</sub>	Turnover number
kDa	Kilo Dalton
K <sub>m</sub>	Michaelis constant
LB	Luria-Bertani broth
LCA	Life cycle assessment
LDH	Lactate dehydrogenase
MEP	Methyl-D-erythritol-4-phosphate
MeSa	Methyl salicylate
MFSP	Minimum farnesene selling price
MK	Mevalonate kinase
MVA	Mevalonate
NADH	Nicotinamide adenine dinucleotide
NASA	National Aeronautics and Space Administration
NO <sub>x</sub>	Nitrogen oxides
NREL	National Renewable Energy Laboratory
NSI	Neutral site I
NSI'	Upstream NSI region
NSI''	Downstream NSI region
NSII	Neutral Site II
NSII'	Upstream NSII region
NSII''	Downstream NSII region
NSIII	Neutral site III
NSIII'	Upstream NSIII region
NSIII''	Downstream NSIII region
OBPs	Odorant binding proteins
OpEx	Operating expenditures
ORs	Odorant receptors
OUPF	Orientation-specific upstream forward primer
PBR	Photobioreactor
PCR	Polymerase chain reaction
PCX	Paclitaxel
PHLS	$\beta$ -phellandrene synthase
PT	Prenyl transferase
PMD	Mevalonate 5-pyrophosphate decarboxylase
PMK	Mevalonate 5-phosphate kinase

ppm	Parts per million
RBS	Ribosome binding site
RDRP	Reversible deactivation radical polymerization
RFP	Red fluorescent protein
RP	Reverse primer
SARS	Severe acute respiratory syndrome
SCN	Soybean cyst nematode
SDS-PAGE	Sodium dodecyl sulfate-polyacrylamide gel electrophoresis
SIP	Iso paraffin
Sm <sup>R</sup>	Streptomycin and spectinomycin resistance
TEA	Techno-economic analysis
TPEs	Thermoplastic elastomers
tHMGR	Truncated HMGR
T <sub>g</sub>	Glass transition temperature
TPS	Terpene synthase
VOC	Variable operating cost

## Notations

$\alpha$	Alpha
$\beta$	Beta
$\gamma$	Gamma
$^{\circ}\text{C}$	Degree celsius
$^{\circ}\text{C}/\text{min}$	Degree celsius per minute
h	Hour
Gt	1 billion tonnes
%	Percentage
\$	Dollar
\$/kg	Dollar per kilogram
mg	Milligram
mg/L	Milligram per liter
mg/g DCW	Milligram per gram dry cell weight
mg/L/day	Milligram per liter per day
g/L	Gram per liter
g/m <sup>3</sup> /day	Gram per meter cube per day
$\mu\text{mol photon}/\text{m}^2/\text{s}$	Micromole photons per meter square per second
$\mu\text{l}$	Microliter
$\mu\text{g}$	Microgram
$\mu\text{g}/\text{L}$	Microgram per liter
$\mu\text{g}/\text{L}/\text{day}$	Microgram per liter per day
M	Molar
mM	Millimolar
rpm	Revolution per minute
v/v	Volume by volume